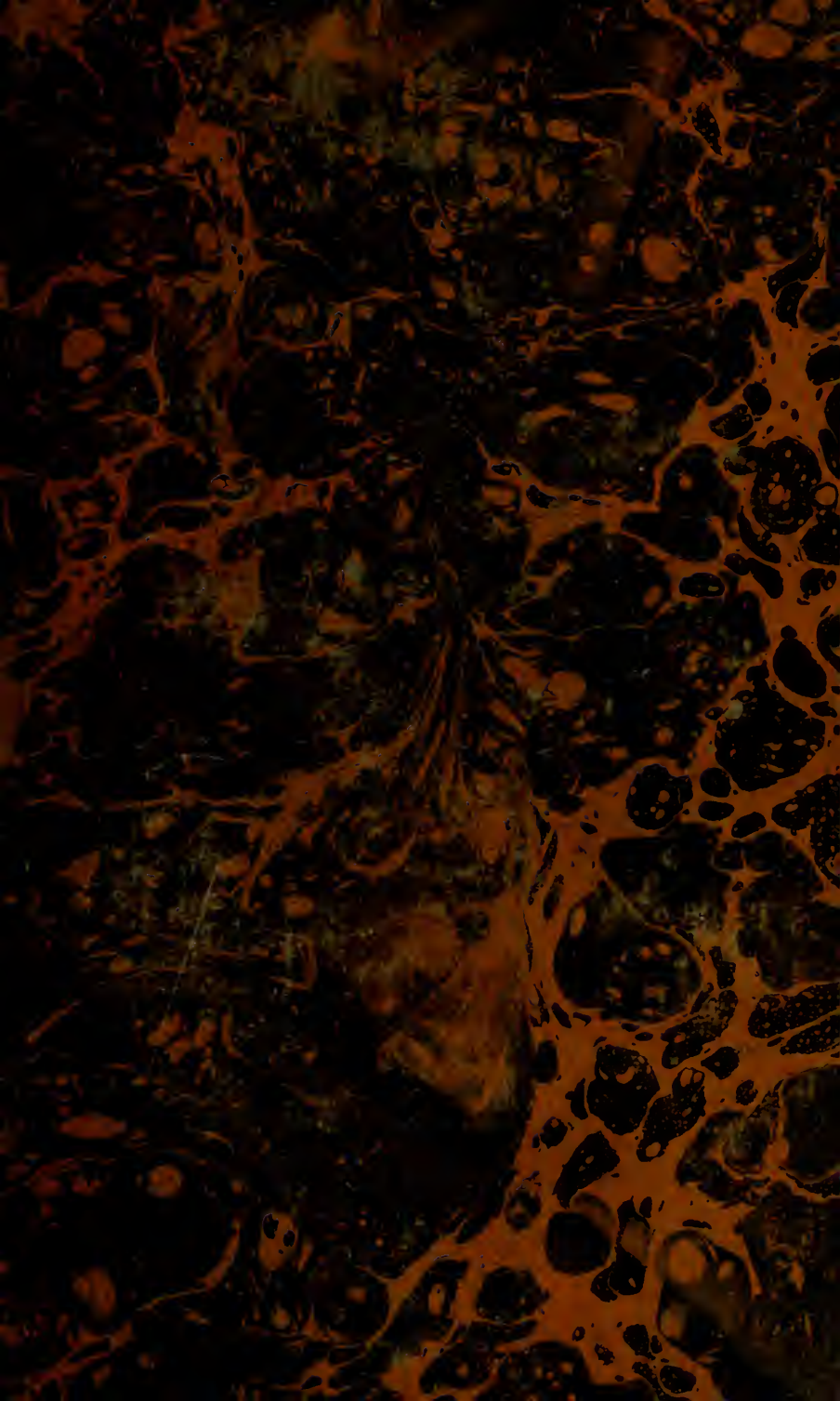




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CONTAINING

A THEORY OF THE EARTH,

A GENERAL

HISTORY OF MAN,

OF THE BRUTE CREATION, AND OF

VEGETABLES, MINERALS,

&c. &c.

FROM THE FRENCH.

WITH NOTES BY THE TRANSLATOR.

IN TEN VOLUMES.

VOL. VI.

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BUFFON'S

NATURAL HISTORY.

OF DOMESTIC ANIMALS.

THE CAT.

THE cat is a faithless domestic, and only kept through necessity to oppose to another domestic which incommodes us still more, and which we cannot drive away ; for we pay no respect to those who, being fond of all beasts, keeps cats for amusement. Though these animals are gentle and frolicksome when young, yet they even then possess an innate cunning, and perverse disposition, which age increases,

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and which education only serves to conceal. They are naturally inclined to theft, and the best education only converts them into servile and flattering robbers; for they have the same address, subtilty, and inclination for mischief or rapine. Like all knaves they know how to conceal their intentions, to watch, wait, and choose opportunities for seizing their prey; to fly from punishment, and to remain away until the danger is over and they can return with safety. They readily conform to the habits of society, but never acquire its manners; they have only the appearance of attachment, as may be seen by the obliquity of their motions, and the duplicity of their looks; they never look in the face of those who treat them best and of whom they seem to be the most fond, but either through fear, or falsehood, they approach him by windings to seek for those caresses they have no pleasure in but only to flatter those from whom they receive them. Very different from that faithful animal the dog, whose sentiments are all directed to the person of his master, the cat appears only to feel for himself, only to love conditionally, only to partake of society that he may abuse it; and by this disposition he has more affinity to man than the dog, who is all sincerity.

The

The form and temperament of the cat's body perfectly correspond with his disposition. He is handsome, light, adroit, cleanly, and voluptuous; he loves ease, and searches out the softest places for rest and repose. The cat is very amorous, and what is uncommon among animals, the female appears more ardent than the male; she seeks for and invites him, and by her loud cries announces the fury of her desires or rather the pressure of her wants; if he flies from or disdains her, she pursues, tears, and though their approaches are always accompanied with acute pain, she forces him to comply with her desires. This passion of the female continues nine or ten days, and commonly happens only twice a year in the spring and autumn, but sometimes three and even four times. They go with young 55 or 56 days, and they usually have from four to six at a litter. As the males are apt to devour their progeny, the females commonly conceal themselves when they litter, and if suspicious of a discovery, they carry their young ones away in their mouths and hide them in holes or inaccessible places. After suckling them a few weeks, the old one takes them mice or small birds, to accustom them to eat flesh; but by an unaccountable caprice, these very mothers so tender and careful, become sometimes so cruel
and

and unnatural, as to devour their offspring themselves.

Young cats are gay, sprightly, and full of frolic, and would be very good amusement for children if nothing was to be feared from their claws. Their play however, though always light and agreeable, is never innocent, and soon turns into habitual mischief. As they can only exert their talents on small animals, they watch birds, mice, and rats with the greatest patience, which they seize with avidity, and without being taught, become more expert hunters than the best instructed dogs. Their dispositions being naturally averse to all restraint, they are incapable of a regular education; we are told however that the Greek monks of Cyprus* taught cats to hunt and destroy the serpents with which that island was infested; but perhaps this hunting was more from their natural inclination to destroy than from obedience, for they take great delight in watching, attacking and destroying all feeble animals without distinction, as birds, young rabbits, leverets, rats, mice, bats, moles, frogs, toads, lizards, and serpents. They are without docility, and their scent, which in the dog is so eminent a quality, is very indifferent, and therefore they

* Description of the Islands of the Archipelago. By Dapper
p. 51.

hunt by the eye only ; neither do they properly pursue, but rather lie in wait and attack the animals by surprise ; and after having played with, and tormented them a long time, they kill them without any necessity, even when well fed and in no want of prey to satisfy their appetites.

The most immediate physical cause of their inclination to seize other animals by surprise, comes from the advantage they receive from the particular conformation of their eyes. The pupil in man, and many other animals, is capable of a certain degree of contraction and dilatation ; it enlarges a little when the light is faint, and contracts when it becomes too strong ; in cats and nocturnal birds, as owls, &c. this contraction and dilatation is so considerable that the pupil, which in the dark is large and round, becomes in the day, long and narrow like a line ; and therefore these animals see better in the night than in the day. There is a perpetual contraction in the eye of the cat during the day, and it is only by a great effort that he can see in a strong light, whereas, in the twilight, the pupil resumes its natural form, he sees perfectly, and profits from this superiority to know, attack, and surprise his prey.

It cannot be said that cats, though living in

our houses, are entirely domestic. The most familiar are not under any subjection, but rather enjoy perfect freedom, as they only do just what they please, and nothing is capable of retaining them in a place which they are inclined to desert. Besides, most of them are half wild, know not their masters, frequent other granaries, and never visit the kitchens and offices belonging to the house but when pressed to it by hunger.

Cats have less attachment to persons than to houses. When taken to the distance of a league or two they will return to their former abode of their own accord, possibly because they there know all the retreats of the mice, the outlets and passages about the house, and because the labour of the journey back is less than it would be to acquire the same facility in a new place. They fear water, cold, and bad smells; they love to be in the sun, and to lie in warm places; they are very fond of perfumes, and willingly allow themselves to be taken and caressed by those who make use of them. The scent of the valerian root has so powerful an effect on them that it appears to transport them with pleasure; to preserve this plant in the gardens it is necessary to surround it with a close fence, for the cats smell it at a distance,

distance, will come about it in numbers, and by rubbing and passing and repassing over it very soon destroy the plant. They do not come to their full growth in less than fifteen or eighteen months, but they are capable of engendering before the end of the first year, and they can procreate all their lives, which seldom exceeds eight or nine years; they are notwithstanding, very lively and hardy, and more nervous than most other animals which live longer.

Cats can only chew slowly, and with difficulty; their teeth are so short and so badly placed, that they rather serve them to tear than grind their food, and, therefore, they always give the preference to tender victuals; they are very fond of fish, which they will eat either raw or boiled; they drink frequently; their sleep is not sound, and they often assume the appearance of sleep for some artful design; they walk gently, and without making any noise. They are very cleanly, and as their coat is always dry their hair easily electrifies, and the sparks are seen to come from it merely by rubbing the hand across it in the dark. Their eyes also sparkle in the dark like diamonds, and seem to reflect in the night the light
they

they may be said to have imbibed during the day.

The wild cat (*fig. 50.*) couples with the domestic one (*fig. 51.*) and consequently form but one species. It is not uncommon for both males and females to quit their houses when they are proud and go into the woods to seek wild cats, and afterwards return to their former habitations; it is for this reason that some of our domestic cats so entirely resemble the wild ones. The greatest difference between them is internally, the intestines of the domestic cat being longer than those of the wild cat, although the latter is much the largest and strongest; his lips are also always black, his ears more stiff, his tail larger, and his colour more uniform. In this country we know but one species of wild cat, and it appears from the testimony of travellers that this species is found in almost all climates without any great variety. There were some of them upon the new Continent before its discovery: a huntsman carried one to Christopher Columbus which was of the common size, of a dark grey colour, and had a very long strong tail. There were wild ones found at Peru, but none in a tame state; as also in Canada, in the county of Illinois, &c. They have been seen in many parts of Africa,



FIG. 50.

Wild Cat.



FIG. 51.

Domestic Cat.

Africa, as in Guinea, and the Gold Coast, at Madagascar, where the natives had domestic cats, and at the Cape of Good Hope, where Kolbe says, there are also, though in a small number, wild cats of a blue colour ; and these blue or rather slate-coloured cats are also found in Asia. Pietro della Valle says*, “ In Persia there are cats of a species which properly belong to the province of Charazan. Their size and form are like those of the common cat ; their beauty consists in their colour, and in their hair which is grey, spotless, and uniform over the whole body, except that it is darker on the back and the head, and shaded lighter on the breast and belly, until it approaches a degree of whiteness ; which agreeable mixture, to use the language of the painters, forms a kind of *chiaro-obscuro* that has a wonderful effect. Besides their hair is shining, soft and delicate as silk, and so long, that, though more smooth than rough, yet it is curled, particularly under the neck. These cats are to the rest of their species, what the water-dogs are to that of the dog. The most beautiful part of their body is the tail, which is very long and covered with hair of five or six inches in length, and which they turn up over their backs like the squirrel, and
the

* Travels of Pietro della Valle, vol. v. pp. 98 and 99.

the upper point resembles a plume of feathers. They are very tame, and the Portuguese have brought them from Persia into the Indies." From this description it appears, that, except in colour, these cats resemble those of Angora (*fig. 52.*) It is probable, therefore, that the cat of Chorazan, in Persia, and the cat of Angora, in Syria, are of the same race, and whose beauty proceeds from the particular influence of the climate of Syria; in the same manner as the Spanish cats (*fig. 53.*) which are red, white, and black, and whose hair is soft and glossy, are indebted for their beauty to the climate of Spain.

In general it may be remarked, that of all the climates of the inhabited globe, those of Spain and Syria are the most favourable to these beautiful varieties in nature. The sheep, goats, dogs, cats, rabbits, &c. of those countries, have the finest wool, the most beautiful and longest hair, and the most agreeable and most varied colours. Both the hair and colour of the wild cat, like those of most other animals, are coarse; when tamed the former becomes more soft and the latter more variegated, and in the favourable climates of Chorazan and Syria, the hair becomes more long, fine, and copious, and the colours more delicate; the black and
red

Engraved for Barris Button.



FIG. 52.
Spanish Cat.



FIG. 53.
Angora Cat.

red change into a transparent brown, and the dark brown into an ash-coloured grey. By comparing a wild cat of our forests with those of Chorazan, we shall find their greatest difference consists in this shaded variety of colours. As these animals have more or less white upon the belly and sides, it is easy to conceive that to have cats entirely white and with long hair, such as the cats of Angora, we have only to unite those with the most white, in the same manner as is done with rabbits, dogs, goats, stags, &c. In the Spanish cat, which is only another variety of the wild cat, the colours instead of being weakened by uniform shades, as in the Syrian cat, become more bright; the yellow is changed into red, the brown into black, and the grey into white. These cats retain their colours and do not degenerate when transported into America. “In the Antilles, says Father du Tertre, there are a number of cats, probably brought thither by the Spaniards; most of them have red, white, or black marks, and many of the French after eating the flesh, send their skins to France for sale. When we came to Guadaloupe these cats were so accustomed to feed on partridges, doves, thrushes, and small birds, that they would not deign to look upon rats; but no sooner did they

they find the game diminish than they broke their truce with the rats and fought them vigorously."

In general cats are not, like dogs, subject to degenerate when transported into warm climates. Bosman says, "the European cats when carried into Guinea preserve their original figure the same." Their nature is indeed more constant, and as their domestic state is neither so entire, universal, nor perhaps so ancient as that of the dog, it is not surprising that they should have undergone less variation. Our domestic cats, though they differ in colour, do not form distinct and separate races; the climates of Spain and Syria having alone produced varieties which are permanent. To these might indeed be added the climate of Pe-chi-ly, in China, where there are cats with long hair and pendant ears, and of which the Chinese ladies are very fond. These domestic cats with pendant ears, of which we have descriptions, are more removed than those with straight ears, from the wild primitive race.

We shall here close the history of the cat, and with it that of domestic animals; of these our number is confined to the horse, the ass, the ox, the sheep, the goat, the hog, the dog, and the cat. We add not to this list the camel, the elephant

elephant, the rein-deer, and others, which though domestic in other countries, are not familiar to us ; nor shall we enter upon the history of foreign wild animals, till we have given that of the wild animals of our own country. Besides, as the cat may be said to be only half domestic, he forms the shade between the real wild and real domestic animals ; for among the domestic we ought not to include such troublesome neighbours as rats, mice, and moles, which, though inhabitants of our houses and gardens, are not less wild and unsubjected ; since instead of being attached or subservient to man, they fly from him, and in their obscure retreats, retain their manners, habits, and their liberties inviolate.

In the history of each domestic animal we have seen to what a degree the education, protection, and care of man, influence its disposition, manners, and even form. We have seen that these causes, added to the effects of climate, modify and change the species so as to render them very different from what they originally were, whence is occasioned such a dissimilarity among the individuals of the same species that we should be led to consider them as different animals, did they not produce together fertile individuals, which is the sole es-

essential characteristic of every species. We have seen that the different races of domestic animals observe nearly the same order in the different climates with the human race; that like men they are more strong and courageous in cold countries, more civilized and mild in temperate ones, and more dastardly, feeble, ugly, and deformed, in the hot regions; that moreover it is in temperate climates, and among the most civilized nations, that the greatest diversity, mixture, and numerous varieties of each species are found; it is among them also that animals exhibit evident signs of the antiquity of their servitude; their pendant ears, their varied colours, their long and delicate hair, are so many effects produced by the length of time they have been in a domestic state. Of almost all wild animals the ears are erect. Those of the wild boar are erect and stiff, but those of the domestic hog are inclined and half pendant. Among the Laplanders, the savages of America, the Hottentots, the Negroes, and other uncivilized people, all the dogs have erect ears; whereas in Spain, France, England, Turkey, Persia, China, and all other civilized countries, the generality of them have soft and pendant ears. The ears of the tame cat are not so stiff as those of the wild one; and in China, which is an
empire

empire of very ancient civilization, and whose climate is very mild, there are cats with pendulous ears. It is for the same reason that the goat of Angora, whose ears are pendant, should be considered as the animal of his species the furthest removed from his natural state ; the influence so evident of the climate of Syria, added to the domestic state of these animals among a people civilized from great antiquity, would in process of time have produced this variety, which cannot be maintained in any other climate. The goats of Angora brought forth in France, have their ears neither so long nor so pendant as those produced in Syria, and would, probably, after a certain number of generations, assume the ears and hair of the goats of our country.

SUPPLEMENT.

IT has been supposed that I denied the cat the power of sleeping, but this must have arisen entirely from a misconception of my expression ; for although I was not aware of their sleeping so soundly, as I am now informed is sometimes the case, yet I always knew they slept

slept in some degree. M. Pasumot, of the academy at Dijon, has communicated to me a letter on this subject; he says, "Although the cat sleeps seldom, it is very sound, and might sometimes be considered as a kind of lethargy. I have had at least ten instances; a favourite cat used to lay upon the feet of my bed; one night I pushed him away, but found him so immoveable that I conceived him to be dead. I pulled and tossed him about for some time before he shewed any kind of life, when at last he began to awake, but it was even then very slowly. This sound sleep, and difficulty of awaking cats, I have often observed; and I am acquainted with a gentleman who has also been witness of their sleeping in this sound manner, and which he says is always at the time of great heat, or previous to stormy weather."

M. de Lestrie, a merchant of Chalons, in Champagne, has remarked to me, that the breath of cats frequently exhales an odour resembling musk; particularly when they purr and are tranquil, or when suddenly alarmed and make a hissing noise, from which he inclines to conclude that there are some vessels in the breast of a cat filled with an aromatic quality; but nothing of this nature is to be discovered by anatomy.

In

In my former history of this animal, I remarked there were cats in China, whose ears were pendant, but as this variety is not found in any other place, it is possibly an animal of a different species; and I am led to this supposition from there being an animal called *Sumxu*, mentioned by travellers, which they say they can compare to nothing but the cat, which it greatly resembles. It is found among the Chinese, who are extremely partial to it, both on account of its beauty, its hair being of a bright black or yellow colour, and because it readily destroys rats.

We have also another variety of cats in our own climates; as there are some produced with pencils at their ears. M. de Save writes me word, that in November, 1773, he had a young kitten brought forth at his house in Paris, very like what we have described as a Spanish cat, with pencils at her ears, although neither of the parents had them, and that in a few months they were as large in proportion to her size as those of a Canadian lynx. At Madagascar they have tamed some wild cats which have twisted tails, and are called *Saca* by the inhabitants; but they intermix with the domestic, and are of course of the same species. I have had the skin of an animal sent me from Cayenne,
which

which much resembles a wild cat. They call it Haïra in Guiana, and the natives there eat its flesh, which is white and palatable; I therefore suspect a mistake has been made in its name, and that it is the Taïra, a small martin, of which notice is taken in the latter part of this work.

CHAP. III.

OF WILD ANIMALS.

IN the History of Man, and of Domestic Animals, we have seen Nature solely as she is constrained; we have rarely seen her perfect, often altered and deformed, and always either surrounded with shackles or loaded with extraneous ornaments. We shall now behold her decked out by simplicity alone, but more attractive by her artless beauty, by her free air, by the sprightliness of her movements, and by all

all the other attributes of true dignity and independence. We shall behold her traversing the surface of the earth with sovereign sway, portioning her domain among the other animals, and dividing to each species its element, climate, and subsistence; we shall survey her in the forests, in the waters, and in the plains, dictating her simple but immutable laws; imprinting upon every species her indelible characters; dispensing her gifts with equity, and counter-balancing evil with good; we shall observe her giving to some strength and courage accompanied with hunger and voracity; to others mildness, temperance, and agility, attended with fear, inquietude, and timidity; and to all liberty, with uniformity of manners, and ardour in love, which they can easily satisfy, and is always followed by a happy fecundity.

Love and liberty, what blessings! Have those animals which we call *savage*, because they are not subjected to our will, need of aught more to make them happy? If so, they enjoy another blessing, that of living in a state of equality; they are neither the slaves nor tyrants of each other; the individual has not, like man, to dread the rest of his species; they enjoy peace among themselves, and are strangers to war, but when brought on them by other animals

or men. No wonder then that they should shun the human race, steal from our view, live in solitudes remote from our habitations, employ all the resources of their instinct to provide for their safety; and in order to exempt themselves from the power of man, that they should exert every expedient of that liberty which Nature has bestowed on them, together with the desire of independence.

Some animals, and they are the most mild, innocent, and tranquil, are contented with remaining at a certain distance from us, and living in our fields; others more fierce and distrustful, conceal themselves in the recesses of woods; others, as if they knew there was no safety on the surface of the earth, dig themselves subterraneous abodes, take shelter in caverns, or gain the summits of most inaccessible mountains; and others, the most ferocious and most powerful, inhabit deserts only, and reign like sovereigns in those burning climates, where man, as savage as themselves, is unable to dispute the empire with them.

As all beings, even the most independent, are subjected and governed by physical laws, and as brute animals, as well as man, experience the influences of the air and soil, so it appears, that the same causes which have softened

tended and civilized the human species in our climates, have produced similar effects upon all other species. The wolf, which is perhaps the most ferocious animal in the temperate zone, is by no means so terrible or cruel as the tiger, the panther, and the lion of the torrid zone; or as the white bear, the lynx, and the hyæna of the frozen zone. And this difference is not only general, as if Nature, to give a degree of harmony to her productions, had calculated the climate for the species, or the species for the climate, but in each particular species the climate is calculated for the manner, and the manners for the climate. In America, where the heat is less violent, and the air and soil more benign than in Africa, though under the same line, the lion, tiger, and panther, have nothing terrible in them but the name. They are no longer tyrants of the forests, intrepid enemies of mankind, monsters which delight in blood and carnage: but they usually run from before man, and instead of waging open war even against other animals, employ stratagem and artifice to take them by surprise; in a word, they may be rendered subservient and almost domestic; therefore were ferocity and cruelty the characteristic of their natures, they must have degenerated, or rather felt the

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influence of the climate; under a milder sky their dispositions have become milder; every excess in them has been tempered, and by these changes they have become more conformable to the nature of the country which they inhabit.

The vegetables which cover this earth and are more connected with it than the animal that feeds upon them, partake in a superior degree of the nature of the climate. Every country, every degree of temperature, has its particular plants. At the foot of the Alps we find those of France and Italy, and on their summit those of the northern regions, which very plants we also meet with on the frozen pinnacles of the African mountains. On the south side of the mountains which separate the Mogul empire from the kingdom of Cashmire, we see all the plants of the Indies, and on the other side we are surprised to find none but those of Europe. It is from intemperate climates that we also derive drugs, perfumes, poisons and all the plants whose qualities are excessive. The productions of temperate climates, on the contrary are always mild. Of such happy spots, herbs and roots the most wholesome, the sweetest fruits, the gentlest animals and the most polished men, are the delightful appurtenances.

purtenances. Thus the earth produces plants, the earth and plants make animals, and of the earth, plants, and animals, are formed men; for the qualities of vegetables, proceed immediately from the soil and air; the temperament and other relative qualities of animals which feed on herbs, have a close affinity to the particular kinds they use, and the physical qualities of men, and other animals which subsist on flesh, as well as on vegetables, depend, though more remotely, on the same causes, whose influence extends even to disposition and manners. Size and form, which appear to be absolute and determined qualities, depend, nevertheless, like the relative qualities upon the influence of the climate. The size of our largest animals are greatly inferior to that of the elephant, rhinoceros, or hippopotamus; our largest birds are but small if we compare them with the ostrich, condor, or the cassowary; and what comparison can be made between the fishes, lizards, and serpents of our regions, and the whale, the walrus, and manati, which inhabit the northern seas; or the crocodiles, large lizards, and enormous adders which infest the southern climes, both by land and water? And if we consider each species in different climates, we shall find sensible varieties both in size and figure,

figure, as we have already evinced in the history of the horse, goat, hog, and dog. These changes are, however, produced but slowly and imperceptibly; the grand workman of nature is Time, and his operations are equal, uniform, and regular; he performs nothing by starts; nothing but by degrees, by shades, and by succession; and what he does, however imperceptible at first, becomes gradually sensible, and is, at length, marked by effects which it is impossible to mistake.

Wild and independent animals are, of all living beings, man not excepted, the least subject to changes and variations of any kind. Possessed of absolute liberty in the choice of their food and climate, their nature varies less than that of domestic animals, which we enslave, transport, mal-treat, and feed without consulting their taste. Wild animals live uniformly in the same manner; they wander not from climate to climate; their native wood is a country to which they are faithfully attached, and from which they never remove but when they feel they can no longer live in it with security. When they fly it is less to avoid their natural enemies than the presence of man. Nature has supplied them with resources against other animals; with them they are on a level; they
know

know their strength, their cunning, their designs, their haunts, and if they cannot avoid, they oppose them with force to force. But how can they guard against beings who can seize without seeing, and can destroy without approaching them? It is man, therefore, who disturbs, and who disperses these wild animals, and renders them a thousand times more savage than they would otherwise be, for the greater part require nothing but tranquillity, nothing but a moderate and innocent use of the air and earth.

By Nature they are prompted to reside together, to unite in families, and to form a kind of social intercourse. Of this intercourse we still find vestiges in countries not totally engrossed by man; we there find works achieved in common, designs which, without being founded on reason, seem, nevertheless to be projected for rational convenience, and the execution of which supposes at least an union and concurrence of individuals occupied in it. Nor is it by physical force or necessity, like the ants, the bees, &c. that the beavers labour and build; unconstrained either by space, time, or number, they assemble from choice. Those that agree dwell together; and those that disagree live apart; and some, from being perpetually

petually repulsed by the body, are obliged to lead a solitary life. It is only in remote and desert countries, where there is little dread of the approach of man, that they endeavour to establish themselves, and render their habitations more fixed and commodious, by constructing dwellings, or, as it were, small hamlets, which not unaptly represent the first efforts and feeble labours of an infant commonwealth. In countries, on the contrary, over which man is diffused, terror seems to dwell, all society is lost among animals, all industry ceases, and every art is suppressed; they relinquish the occupation of building, and neglect every accommodation; always pressed by fear and necessity, their only study is to live, and their only employment flight and concealment; and if, as may reasonably be supposed, the whole surface of the earth should, in process of time, be equally inhabited by the human species, in a few centuries the history of a beaver would be considered as a fable. The faculties and talents of animals, therefore, instead of increasing are constantly diminishing, for time may be said to oppose them. The more the human species are multiplied and improved the more they become subjected to the dominion of an absolute tyrant, who will hardly permit their individual existence,

ence, deprives them of liberty, of every avenue to society, and destroys the very root of their intelligence. What they are become, or what they may become, is an inadequate indication of what they have been or might be. Who can say, if the human species were annihilated, to which of the animals would the sceptre of the earth belong?

THE STAG, OR RED DEER.*

THE Stag is one of those mild, peaceable, and innocent animals, which seem created to adorn and animate the solitudes of the forest, and to occupy, remote from man, the peaceful retreats of Nature. His light and elegant form, his flexible yet nervous limbs, his grandeur, strength, and swiftness, his head, rather adorned than armed with living branches, which, like the leaves of a tree, are every year renewed, sufficiently distinguish him from the other inhabitants of the forest. As he is the noblest among

* The stag, in Greek *ελκφος*; in Latin *cervus*; in Italian *cervo*; in Spanish *cierwo*; in Portuguese *ucado*; in German *Lirsch*; in Danish *biort*; in Swedish *kron biort*; in Dutch *bert*; in Polish *jelijenii*.

among these, he has been made subservient to the pleasures, and employed the leisure of the greatest heroes. The exercise of the chace may well succeed, or should rather precede the fatigues of war. To be acquainted with the management of horses and arms are talents equally common to the warrior and the hunter. A familiarity with address, bodily exercise and fatigue, so necessary to support courage, are found in the chace, and carried into the field of battle. Hunting is an agreeable school of a necessary art; the only amusement which entirely detaches diversion from business; the only recreation that is totally unaccompanied with effeminacy, and always produces a lively pleasure, that never satiates or cloyes. In what manner can those men be better employed who, from their situations, are constantly fatigued with company, than in hunting? Continually, as it were, beset with a multitude, exposed to the importunity of their demands, forced to attend to the affairs of others, to embark in matters of the greatest concern, and, in effect, to be the more constrained in proportion to the elevation of their stations; great men would only feel the irksome weight of grandeur, and exist only for others, if they did not occasionally abstract themselves from a crowd

crowd of attendant flatterers. To enjoy themselves in real social affections, to preserve private friendships, to nourish sentiments a thousand times more precious than all the ideas of grandeur, they have need of retirement from the bustle of business, and what retirement can afford greater variety, or be accompanied with more animation than the chase? what exercise can be more beneficial to the body? what relaxation more agreeable to the mind?

To be always acting, or holding intercourse with man, would be as fatiguing as perpetual thinking. Man is not intended by Nature for the contemplation of abstract matters; to occupy himself in different pursuits, to lead a sedentary life, and to make his study his centre of existence, is, by no means, a natural situation, any more than it is to be perpetually agitated by the caprices of other men, and to be continually constrained to keep a guard over his looks, words, and actions. Whatever ideas we may entertain of ourselves, it is evident that to personate is not to be, and that we are less calculated to think than to act, to reason than to enjoy. True pleasure consists in the unrestrained use of ourselves. Our best possessions are those we have from Nature. It is the air and the earth, the plains and the forests,

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that yield us full enjoyments, full of utility, and never to be exhausted. A taste for the chace, fishing, gardening, and agriculture, is therefore natural to all men; and in societies more simple than ours there subsists but two orders both relative to this mode of life; the nobles, whose employment is war and hunting, and the lower people whose sole office is the cultivation of the earth.

In polished societies, where every thing is refined and brought to perfection, to render the pleasures of the chace more lively and delightful, and to ennoble an exercise which is in itself noble and beneficial, it has been formed into an art. The chace of the stag requires a species of knowledge which can only be acquired by experience; it supposes a royal assemblage of men, horses, and hounds, all so practised, trained and disciplined, as by their mutual intelligence to contribute to one end. The huntsman ought to be able to judge of the age and sex of the animal. He should be able to distinguish exactly whether the stag which his hound has *harboured*, be a *brock*, or a staggard; whether it be a young stag, not passed his seventh year, or an old one: the principal data to obtain this knowledge from, are the print of his foot, or his excrement. The foot of the stag
is

is better formed than that of the hind; her *leg** is larger and nearer to the heel. His steps leave rounder impressions, and are further asunder; he walks more regularly, and brings the hind foot exactly into the impression made by the fore foot; whereas the paces of the hind are not only shorter, but her hind foot does not so regularly fall into the track of her fore foot. A stag of the fourth head, that is, has acquired his fourth horns are easily distinguished; but it requires much experience to know the foot of a young stag from that of a hind. A stag of six or seven years is still more easily distinguished, for his fore feet are much larger than his hind ones, and the older he grows the thicker, or more worn, are the sides of his feet; the distance of his steps are also more regular, his hind foot resting always with tolerable exactness upon the track of his fore foot, unless when they shed their horns, when the old stag is as liable to mistake as the young ones, though in a different manner, and with a regularity unknown to the young stag or the hind, for they rest the hind foot always at the side of the fore one, and never either beyond or within that reach.

In

* By the *leg* is understood the two bones at the lower extremity behind the foot, which leave an impression upon the ground as well as the foot.

In the dry season, when the huntsman cannot judge by the footstep, he is obliged to return upon the track of the animal, and endeavour to find his dung. To be able to determine by which requires perhaps more experience than a knowledge of the footsteps, yet without it the huntsman could not make a just report to the sportsmen assembled. When, in consequence of this report, the dogs are led to the shelter of the stag, the huntsman should know how to animate his hound, and make him rest upon the track of the stag until he be dislodged. Instantly the horn is sounded to uncouple the dogs, which the huntsman should encourage both by the horn and his voice; he should also carefully mark the footsteps of his stag, that he may discover if he should start another, and substitute him in his place; it will, in that case, sometimes happen that the dogs will divide and form a double chace; when so, the huntsmen should divide also and recal those dogs which have thus gone astray. The huntsman should always accompany his dogs, and continue to animate without pressing them too hard; he should also assist them in order to prevent their being deceived by the stag, who will try a number of artifices to elude them; he will frequently trace and
retrace

retrace his own steps, mix with others, and endeavour to draw a young one to accompany him, and so put a change upon the dogs ; he will then redouble his speed, dart off one side, or lie down upon his belly to conceal himself. In this case, when the dogs have lost his foot, the huntsman and the hounds labour in conjunction to recover it ; but if unable to hit upon his track, they conclude he is resting within the circuit they have made ; if their endeavours continue unsuccessful, they have no other way left them than to take a view of the country, which may give them an idea of the place of his refuge. When discovered, and the dogs are again put upon his track, they pursue with more advantage, as they perceive that the stag is fatigued ; their ardor augments in proportion as his strength diminishes ; and their perception is more lively, as the animal becomes heated ; they then redouble their cries and their efforts, and though he is now more full of stratagems than ever, yet as his swiftness diminishes, his doublings and artifices become less effectual, and he has no other resource but to abandon the earth which has betrayed him, and get into the water to make the dogs lose their scent. The huntsmen traverse these waters,
and

and again put the dogs upon the track of his foot; after which he is incapable of running far, and reduced to the last extremity, stands at bay

He still endeavours to defend his life, and often wounds dogs, horses, and even huntsmen with his horns, until one of them ham-string him that he may fall, and then put him to death by a stroke of his hanger. They then celebrate the death of the stag with a flourish of horns, and the dogs partake of the victory by their perquisite of his flesh.

All seasons are not alike proper for hunting the stag. In spring, when the forests begin to be cloathed with leaves, and the earth to be covered with verdure and flowers, their odour diminishes the scent of the hounds, and as the stag is then in his full strength it is difficult for them to overtake him. The huntsman also agree that the season when the hinds are about to bring forth is that in which the chase is attended with the most difficulty; and that, at that time the dogs will quit a fatigued stag, to follow any hind that gambols before them: and in like manner, at the beginning of autumn, which is the stag's rutting season, the blood-hounds lose all their ardour in hunting; the strong scent of the rut probably renders the track less distinguishable, and very possibly the
scent

scent of all stags is at this season nearly the same. In winter, when the snow lies on the ground, it is also improper to hunt the stag, as the hounds have no scent, and appear to follow the track rather by the sight than the smell. At this season, as the stags find not sufficient food in the forests, they issue forth into the open country, and go even into inclosures and cultivated lands. They unite in herds in the month of December, and when the frosts are severe, they endeavour to find shelter by the side of a hill or in a thicket, where they lie close, and keep themselves warm by means of their breath. At the end of winter they frequent the borders of the forests, and frequently destroy the rising corn. In spring they shed their horns, which fall off spontaneously, or by a small effort after entangling them with the branch of some tree. It is seldom that the horns of both sides fall at the same time, there usually being an interval of a day or two between them. The old stags shed their horns first, which happens about the end of February, or beginning of March; those in the seventh year in the middle of March; those in the sixth year, the beginning of April; the young stags, those from three to five years old, the beginning, and the prickets not till the middle, or latter end of May.

May. But in all this there is much variety, for old stags sometimes shed their horns later than those which are young; besides they are more forward in casting their horns when the winter has been mild, than when severe and of a long continuance.

After the stags have cast their horns they separate, the young ones only keeping together. They remain no longer in deep covert, but seek the beautiful part of the country, and continue among the coppices during the summer, and until their antlers are renewed. In this season they carry their heads low for fear of rubbing their horns against the branches; for they are very tender until they arrive at perfection. The horns of the eldest stags are not more than half renewed by the middle of May, nor acquire their full growth and hardness before the end of July; the younger stags are later both in shedding and having them renewed; but when completely lengthened and hardened, they rub them against the trees to clear them from a scurf with which they are covered; and as they continue this practice for several days successively, it has been said their horns receive a tint from the juices of the trees against which they are rubbed; that they derive a red cast from the beech and birch, a brown one from

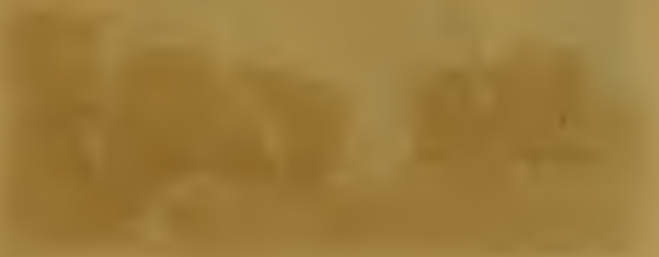




FIG. 54.

Stag.



FIG. 55.

Hind.

from the oak, and a black one from the elm, or trembling poplars. It is also asserted that the horns of the young stags, which are smother and unpearled, are not so much tinged as those of the old ones, which are rougher, and covered with these pearlings, which retain the sap of the tree. But I cannot be persuaded that this is the true cause, for I have had tame stags shut up in inclosures, where there was not a single tree, whose horns were, nevertheless, coloured in the same manner as those of other stags.

Soon after the stag (*fig. 54.*) has polished his horns he begins to feel an inclination for the females, and in which respect the oldest are most forward. By the end of August, or beginning of September, they leave the coppice, return to the forest, and begin to search out for favourite hinds; (*fig. 55.*) they cry with a loud voice, their necks and throats swell, they grow restless, and traverse the fallow grounds and plains in open day, and they dart their horns against the trees and hedges; in a word they seem transported with fury, and range from place to place till they have found their females, whom they then have to pursue and overcome, as the hind flies from him, and never becomes subservient to his passion until she is subdued by fatigue: those hinds which

are most advanced in years are first in season. If two stags approach the same hind a combat must precede the enjoyment ; if their strength is nearly equal, they threaten, plough up the earth with their paws, make a terrible noise, and dart upon each other with the utmost fury, carry on their battles to such extremities that they often inflict mortal wounds with their horns ; nor is the combat ever concluded but by the defeat or flight of one of them. The conqueror loses not an instant to enjoy the fruits of his victory, unless another male happens to appear, when he is again obliged to quit his mate, and put him to flight as he had done the other. The oldest stags are sure to gain the battle, because they are more fierce and stronger than the young ones, who are obliged to wait patiently until their seniors are satisfied and quit the hind ; though sometimes indeed, they take the advantage while the two old ones are fighting, and then make a precipitate retreat. The hinds also prefer the old stags, not merely because they are the most valiant, but because they are more ardent. They are also the most inconstant, and commonly have several females at the same time ; and when they happen to have but one, they remain attached to her but a very few days, when

when they go in search of a second, with whom they remain a still shorter time, and then wander from female to female until they are quite exhausted. This amorous fury, however, lasts not above three weeks, during which time they eat but little, and are strangers to all repose; night and day are they on foot, ranging about, fighting with the males, or enjoying the females, and of course, when the rutting season is over, they are so wasted, meagre, and fatigued, that they require a length of time to recover their strength. They then retire to the borders of the forests and graze on the best cultivated lands, where they find food in abundance, and where they continue until their strength is restored.

The rutting time among the old stags commences about the first and concludes about the 20th of September; with those in the sixth or seventh year it begins in the middle of September, and ends the beginning of October; with the young stags it begins about the 20th of September and lasts to the 15th of October, by the end of which month the rutting is all over, except among the prickets, who, as well as the young hinds, are the latest in coming in season; thus by the beginning of November the rutting time is entirely finished; and at
that

that time the stags, being in their weakest state, are most easily hunted down. In those seasons when acorns are plentiful they recover in a very short time, and a second rut will take place towards the end of October, but this is always of a much shorter duration than the first. In warmer climates, as the seasons are more forward, so is the rutting time. Aristotle has told us that in Greece it commences at the beginning of August, and concludes towards the end of September. The hinds carry their young eight months and a few days, and seldom produce more than one fawn; they bring forth in May or the beginning of June; they take the greatest care to conceal their fawns, and will even present themselves to be chased, in order to draw off the dogs, and afterwards return to take care of their young. All hinds are not prolific, and some of them are even barren: these kinds are more gross and fat than the others, and are sooner in heat. It is also said that some hinds have horns like the stags, and this is not void of probability. The fawns are not so called after the sixth month, then the knobs begin to appear, and they take the name of knobbers, which they bear until their horns lengthen into spears, and then they are called brocks, or prickets.

prickets. Though they grow very fast, they do not quit their mothers all the first summer. In winter they all resort together, and their herds are more numerous as the season is more severe; in the spring they divide ; the hinds retiring to bring forth, and it is only the prickets and young stags which then keep together. In general stags are inclined to associate, and it is only from fear or necessity that they are ever found dispersed. At 18 months the stags are capable of engendering, for those brought forth in the spring of the preceding year will couple with the hinds in autumn, and it is to be presumed that such copulations are prolific. If any thing can create a doubt on this subject, it is that the stags have not then attained more than half their growth, for they continue increasing in size till their eighth year, and to that period their horns continue to augment. But it is to be observed that the young fawns gain strength in a little time, that his growth is very quick, both in the first and second years, and that it has already a redundancy of nourishment, because it shoots forth its knobs, which are certain indications of its ability to engender. Animals in general, it is true, are not in a condition to procreate till they have nearly acquired their full growth ;
but

but those which have certain times allotted for copulation, or spawning, seem to be an exception to this rule: fishes spawn and produce young before they have attained a fourth, or even an eighth of their full growth, and among quadrupeds, those that like the stag, elk, fallow-deer &c. have the rutting time precisely marked, copulate sooner than other animals.

There are so many affinities between the nutrition, the production of the horns, the rutting and the generation of these animals, that, for the better conception of the particular effects that flow from them, it is necessary to recapitulate a few of the general principles of procreation. It depends solely on the redundancy of nourishment; as long as the growth of the body continues, (and it is always in early age that this growth is quickest) the nourishment is totally employed in this operation; at that period, therefore, there is no superabundance, consequently no production, no secretion of the seminal fluid, and hence it is that young animals are not in a condition to engender; but when their growth is nearly acquired, the redundancy begins to manifest itself by new productions. In the human race, the beard, hair, increase of the breasts, and organs of generation, appear at the age of puberty. In the brute creation, and particularly the

the stag, the redundancy manifests itself by effects still more sensible, as the shooting of the horns, the swelling of the neck and throat, the rutting, &c. and as the stag is very quick at first in his growth, a year does not pass before this redundance shews itself, by the appearance of his horns. If brought forth in May the horns begin to appear in the May following, and they continue to increase to the end of August, by which time they are full grown, and so hard that he rubs them against the trees to clear them of the scurf; the fat also at this time begins to accumulate, is determined towards the parts of generation, and excites in the stag that ardour and desire which renders him so furious. That the production of horns, and power for generation, proceed from the same cause is evident, for by castration the growth of the horns is effectually prevented; if this operation is performed after he has shed his horns they will never be renewed, and if done when they are perfect he will never shed them again; in fact he will remain all the rest of his life in the same state as when he suffered castration; and as he no longer experiences the ardour of the rut, so the accompanying signs also disappear, and he becomes a tame and peaceable animal. From hence it appears
that

that the retrenched parts were necessary for collecting and diffusing them over his whole body in the form of fat, particularly at the top of the head where it gives rise to the horns. It is true, indeed, that castrated stags become fat, but the productions of their horns ceases, their necks and throats never swell, and their fat is very different from that of the perfect stag, which in the rutting season is so very strong as not only to render the flesh uneatable but offensive to the smell, and will corrupt in a very short time, while that of the former may be long preserved sweet, and eaten at all times. Another proof that the horns are produced by a redundance of the nutritive juices may be drawn from the circumstance, that those of stags of the same age will be either thick or thin, in proportion to the supply of food; for the stag which lives in a plentiful country, where he feeds at his pleasure, and rests at his ease, undisturbed by dogs or men, will always have much larger and more beautiful antlers than he who has scanty subsistence, and is disturbed in his repose; so that it is easy to determine by the horns of a stag whether he have inhabited a rich and quiet country. Those also which are in bad health, have been wounded, or frequently disturbed by hunting, have

have seldom fine horns or good flesh ; they are later in beginning to rut, and their horns are neither shed nor renewed so early as others. Thus every circumstance concurs to prove, that the horns, like the seminal fluid, are merely the redundant superfluity of the organic juices which cannot be employed in developing and supporting the animal body.

It is the insufficiency of food, therefore, that retards the growth of the horns and diminishes their size ; and perhaps it would not be impossible, by scanty diet, greatly to prevent their growth without having recourse to castration. It is certain that castrated stags eat less than others ; and the reason the females of this species, as well as the fallow deer, the roe, and the elk, have no horns, is because they eat less than the males, and because at the very time the redundancy would naturally happen, and appear externally, they are with young, and consequently the superfluous juices are first employed in nourishing the foetus and afterwards in producing milk for the fawn. The objection that the female rein deer is furnished with horns rather supports what is here advanced ; for of all quadrupeds which have horns, the rein deer has by much the largest in proportion to his size, as they frequently extend the whole length of

his body ; he also abounds more in fat, and those of the females are very small comparatively with those of the male ; the instance therefore only serves to prove, that when the redundancy exceeds what can be exhausted by gestation, it diffuses itself outwardly in the same manner as that of the males. These remarks respecting nourishment, are not, however, to be applied to the quantity of provisions, but solely to the quantity of organic molecules which they contain ; the latter being that active and prolific matter which supports animate beings, and the former a dead mass which has no effect upon the body of the animal ; and as the *lichen rangiferinus*, which is the ordinary food of the rein deer, is a more substantial nutriment than the leaves, bark, or buds of trees, on which the common stag feeds, it is not wonderful that the former should have a greater redundancy of organic nutriment, and consequently more fat and larger horns than the latter. It must be allowed, however, that the organic matter, which produces these horns, is not entirely separated from inanimate particles, but preserves even after it has passed through the body of the animal, characteristics of its former vegetable state. The horns of the stag in their make and growth resemble the branches of a tree ; and
its

its substance is perhaps more of the nature of wood than bone; it is, as it were, a vegetable grafted upon animal, partaking of the nature of both, and forms one of those shades by which nature always approximates to the two extremes.

In animals the bones grow at the two extremities at the same time, at first becomes hard in the middle, and at the two ends continue soft and receding therefrom until it has acquired its full length. In vegetables, on the contrary, the wood advances by one extremity only; the bud which unfolds to form a branch is only attached to the old wood by its lower end, and it is from this point that it exerts its power of extension in length. This remarkable difference between the growth of bones and the solid parts of plants, does not take place in the horns of the stag, as nothing can bear a stronger resemblance to their growth than that of a branch of a tree; they extend from one extremity only, they are at first as tender as an herb and then harden like wood. The scurf which covers and grows with them is their bark, which the animals rub off when they are arrived at their full growth; until this is completed the ends remain soft, and likewise divide themselves into a number of branches. In a word there is a
perfect

perfect resemblance in the developement of both, and therefore the organic molecules, which constitute the living substance of the horns of the stag, still retain the image of the vegetable, because they are arranged in the same manner as in vegetables. Here we see that matter has an influence over form. The stag, which lives in the forest, and feeds only on the leaves of trees, receives from them so strong an impression that he produces a sort of tree, of whose origin it is impossible to mistake. This effect, though surprising, is not singular, but depends on that general cause which we more than once have already had occasion to point out.

The most constant and invariable thing in Nature is the image or model allotted to each particular species, both in animals and vegetables; what is most variable is the substance of which they are composed. Matter, in general, seems to receive all forms with indifference, and to be capable of all configurations; the organic and living particles of this matter pass from vegetables into animals, without suffering dissolution or alteration, and equally form the living substance of herbs, trees, flesh, or bones. It may seem from this first glance that matter can never predominate over form,
and

and that no sort of nourishment taken by the animal, provided he can draw out the organic particles, and assimilate them to himself by nutrition, can occasion any change upon his form, and can have no effect but that of supporting, or adding to the growth of his body. Of this we have a proof in those animals which live solely upon herbage, who, though a substance widely different from their own bodies, draw from it every thing necessary to constitute flesh and blood, and will even exceed in bulk those who feed upon animal food. In taking a more particular view of Nature we find this is not always the case. Height, for example, which is one of the attributes of form, varies in every species according to the difference of climate; as do the quantity and quality of the flesh, two other attributes of form, according to the different kinds of food. This organic matter, therefore, which the animal assimilates to its body by nutrition, is not absolutely indifferent to the reception of this or that modification: it is not deprived of its original figure; it continues to act in its own form, and though this action be almost imperceptible, yet, in process of time, it necessarily produces very sensible effects. The stag, who inhabits the forests, and lives only upon wood, produces a species of trees, which is nothing
more

more than the superabundant part of his food. The beaver which inhabits the water, and feeds upon fish, has a tail covered with scales; and the flesh of the otter, as well as of most aquatic fowls, is of a fishy nature. It may therefore be presumed, that animals which live constantly upon one kind of food will, in time, imbibe a tincture of its aliment; and however strong the original impression of nature may be, a kind of transformation will take place by an assimilation contrary to the first. In this case the nourishment no longer assimilates entirely to the form of the animal, but the animal assimilates in part to the form of the nourishment, as is seen in the horns of the stag and the tail of the beaver.

The horns, then, are but an excrescence, a part foreign to the body of the stag, and only esteemed as an animal substance because it grows from him; it is in reality a vegetable production, since it retains all the marks of that vegetable from which it derives its origin, and resembles the branch of a tree in the manner it grows, expands, hardens, dries, and separates; for it falls off spontaneously, after having acquired its full degree of solidity, like a ripe fruit from the branch. The very name given to this production in the French language

guage* is a proof that it has been considered as a species of wood, and not as a horn, a bone, a tusk, a tooth, &c. In addition to these arguments, we may add a fact recorded by Aristotle, Theophrastus, and Pliny, who all assert that ivy has been seen to grow round the horns of stags while they were in a tender state. If this be true and it would be easy to make the experiment, it would still more fully establish the analogy between the wood of the stag and that of trees. The horns and tusks of other animals are not only of a substance different from the branches of a stag, but also in their growth, texture, and form, both exterior and interior, there is nothing which bears any analogy to wood : these and the nails, claws, hair, feathers, scales, &c. grow, it is true, by a kind of vegetation, but a vegetation widely different from that of trees. The horns of oxen, goats, antelopes, &c. are hollow within, whereas those of the stag are entirely solid ; the substance of the former is the same with that of nails, claws, scales, &c. but the horns of the stag resemble wood more than any other substance. All these hollow horns are covered on the inside by a *periosteum*, and contain

* The French word is *bois*, a forest, a wood, likewise used for the substance, or branch of a tree.

contain in their cavities a bone, which serves to support them; they never fall off but continue to increase during the life of the animal, and will assist in determining its age, by the number of annual rings. Instead of growing like those of the stag, from the upper extremity, they grow like nails, feathers, and hair from the lower extremity. Thus it is also with the tusks of the elephant, sea-cow, boar, and all other animals; they are hollow within, and grow only from the lower extremity. These horns or tusks have therefore no more resemblance than nails, hairs, or feathers, to the horns of the stag.

All vegetation is reducible then to three kinds; the first is, when the growth proceeds from the superior extremity, as in herbs, plants, trees, and the antlers of stags; the second, when it is made from the inferior extremity, as in horns, claws, nails, hair, scales, tusks, teeth, feathers, and other exterior parts of animal bodies; the third when the growth advances from both extremities at the same time, as in bones, cartilages, muscles, tendons, and other internal parts of animals. Of all three the proximate cause is the superabundance of organic nourishment, and the only effect, the assimilation of that nourishment, to the mould wherein
it

it has been received. Thus the animal grows more or less quickly in proportion to the quantity of such nourishment, and when the growth is nearly completed, it then seeks to employ itself in the propagation of new organized beings in the manner as we have before stated. The difference between animals, which, like the stag, have fixed seasons, and those which can engender at all times, proceeds likewise from the manner of their feeding. Man and domestic animals, which every day receive an equal quantity of sustenance, and frequently to an excess, may engender at all seasons. The stag, and most wild animals, on the contrary, who suffer much from want in the winter, have no superabundance, nor are in a state to engender till they have recruited themselves during the summer; and it is then the rutting season commences, and during which he exhausts himself so much that he remains the whole winter in a state of langour. His flesh and blood are then so impoverished that worms breed under his skin, which still adds to his misery, and which do not perish till the spring, when he recovers new life from the active nourishment he is abundantly furnished with by the fresh production of the earth.

Thus does this animal pass his whole life in alternate plenty and want, vigour and inanition, health and sickness, without having his constitution much affected by the violence of those extremes ; nor is the duration of his life inferior to those animals which are not subject to such vicissitudes. As he is five or six years in growing, so he lives seven times that number, or from 35 to 40 years. What has been reported of the prodigious longevity of the stag has no foundation, being only a popular prejudice, which took place in the days of Aristotle, and which he did not consider as probable, because, as he observes, neither the time of gestation nor of growth, indicated long life. Notwithstanding this authority, which ought to have abolished the prejudice, it was again renewed in the days of ignorance, and supported by the story of a stag which was taken by Charles VI. in the forest of Senlis, with a collar upon his neck, bearing the inscription "*Cæsar hoc me donavit;*" and the people rather choose to believe this stag had lived a thousand years, and had received his collar from a Roman Emperor, than that he came from Germany, where the Emperors yet assume the name of Cæsar.

The

The horns of the stag increase in bulk and height from the second year to the eighth, and from that time remain with equal beauty during all the vigor of life; but when he begins to decline with age they decline also. It rarely happens that our stags have more than 20 or 22 antlers, and even this number is by no means constant, but he will have a greater number one year than another, according to the nourishment and repose he has enjoyed; and upon the same circumstances the size and quality of the horns likewise depend. It is like the wood of the forest, large, tender, and light, in moist and fertile countries, and short, hard, and heavy in such as are dry and barren. The size and shape of the animals also vary according to the districts they inhabit. Those which range in vallies, or gently-rising hills, abounding in grain, are much larger than those which frequent dry and rocky mountains; the latter are short and thick; they are not so swift as the former, but can run much longer; they are likewise more mischievous; their horns are short and black, like a tree stunted in its growth, whose bark is always of a darkish hue; whereas the horns of those which feed on plains are lofty, and of a clear red, like the wood and bark of trees which grow in a good soil,

soil. These little thick stags generally inhabit among the underwood, where they can the more easily conceal themselves from the pursuit of the dogs. Those of Corsica appear to be the smallest of these mountain stags, and are hardly more than half the size of those common among us, and are, as it were, the terrier among stags; his body is squat, his legs are short, and his hair is dark brown. I am convinced that the size and stature of stags depend upon the quality and quantity of their food, from having reared one, and supplied him very plentifully, who at the end of four years was taller, plumper, and in every respect better furnished than the oldest stags in my woods, though they are of a very large size.

The most common colour of the stag is yellow, though many of them are brown, and some red. White stags are more uncommon, and seem to be a race which have been domesticated, but in very early times, for both Aristotle and Pliny mention them, though as very rare. The colour of the horns, as well as the hair, seems to depend on the nature and age of the animal, and the impression of the air. The horns of the young stags are more white and untinged than those of the old

old ones. Those stags whose hair is a light yellow have often sallow coloured horns; those of a lively yellow their horns are red, and brown ones, especially those which have black hair on their necks, have black horns. It is true that the interior parts of the horns of all stags are almost equally white, but they differ greatly in point of solidity and texture. Some of them are even spongy and have large cavities. The difference of texture is sufficient to account for their difference in colour, without having recourse to the sap of trees as productive of that effect; especially since we daily see the whitest ivory change brown or yellow if exposed to the air, although its substance is more complete than that of the horns of the stag.

The stag seems to have good eyes, an exquisite smell, and excellent ears. When listening he raises his head, pricks up his ears, and then hears from a great distance; when going into or issuing from a coppice, or half-covered place, he stops to take a full view round him, and scents the wind by way of discovering whether any thing is near that is likely to give him disturbance. Though rather simple he has curiosity and cunning. If any one whistle or call to him from a distance, he stops short,
gazes

gazes attentively, and with a kind of admiration; and if those who disturbed him have neither arms nor dogs, he passes along quietly and without altering his pace. With equal tranquillity and delight he appears to listen to the shepherd's pipe, and the hunters to embolden them sometimes make use of those instruments. In general he fears men much less than dogs, and entertains neither distrust nor artifice but in proportion as he is disturbed. He eats slow, selects his food, and when full he seeks out a place to lie down and ruminate at leisure; though he does not seem to perform the act of rumination with the same ease as the ox, and it is not without violence that he can make the food rise from his first stomach; this is occasioned by the length and direction of the passage through which the aliment has to pass. The ox has a straight, short neck, but that of the stag is long and arched; efforts, therefore, are necessary to raise the food, and which efforts are made by a kind of hiccough, the action of which is manifest as long as he continues to ruminate. As he advances in age his voice is more strong and tremulous: that of the hind is weaker and shorter, and she never exerts it from love but only from fear. The stag raises a frightful cry in rutting time, for he is so transported that

that nothing disquiets or terrifies him; he is therefore easily surprised, and being loaded with fat cannot long maintain the chase; but when reduced to an extremity he is dangerous, and will attack the dogs with a kind of fury. He seldom drinks in the winter and not at all in the spring, the dew with which the tender grass is surcharged being then sufficient; but in the heat of summer, he has recourse to brooks, marshes and fountains, and in rutting time he is so overheated that he searches every where for water, not only to appease his immoderate thirst, but to bathe himself and refresh his body. He swims much better at this than at any other time because of his fat, which is specifically lighter than an equal quantify of water. He has been seen to cross large rivers; it has even been asserted that, allured by the scent of the hinds in rutting time, stags will throw themselves into the sea, and pass from one island to another at the distance of several leagues. They leap still better than they swim, for when pursued they easily clear a fence or hedge of six feet high. Their aliment differs according to the seasons: In autumn, after the rutting season, they search out the buds of green shrubs, the flowers of the heath, brambles, &c. in the winter, during snow, they peel the bark off

off the trees, and feed upon that and the moss, &c. and in mild weather they range for provender among the corn fields. In the spring they seek out the trembling poplar, willow, hazel, &c. In summer, when they have abundance, they seem to like no grain so well as rye, and no wood equal to the black-berry bearing alder.

The flesh of the fawn is very delicate, that of the hind and pricket not bad, but that of the full-grown stag has always a strong and disagreeable taste. The skin and the horns are the most useful parts of this animal; from the former is made a very pliable and durable leather. The horns are used by cutlers, and other mechanics, and a volatile salt, much used in medicine, is drawn from it by chemists.

SUPPLEMENT.

BY a letter I received from M. Beccaria, a celebrated Professor at Pisa, dated October 28, 1767, it appears the pupil of the eye of the stag, as well as that of the cat, owl, &c. contracts in the light, and dilates in the dark; of this he was perfectly convinced by some experiments he made with a stag confined in a darkened

darkened apartment, but he found the effect was very different from that in the animals above mentioned, for their contraction and dilation is made vertically, while those of the stag are horizontally.

I have also received information of a fact from M. le Marquis d'Amazaga, that merits being noticed in the history of the stag. We have already observed that their horns begin to acquire the form and existence, which they retain for the remainder of the year, at the beginning of August, and after noticing this fact he proceeds in the relation, "that on the 17th of October the attendants of the Prince of Condé chased a stag six years old, and it being the rutting season they were greatly surprised at the swiftness of his pace and the distance he led them, which was full six leagues from his harbour; and this surprise received no small addition when he was taken, by his horns appearing white and sprinkled with blood, as they are at the season when they rub them against the trees; and it was evident, on his being opened, from the situation of his interior parts, that he had never experienced the effects of the rut, and as he had not been in a condition for rutting he was as loaded with fat as though it had been the month of June, July,

or August. Besides this he had another singularity; his right foot wanted the middle bone, and which in the left was at least half an inch long, large, and pointed. As the stag, if he be castrated when he has no horns, never acquires any after, or never loses them if performed when his horns are in perfection, it is but reasonable to suppose that they were retarded, in the present instance, from the imbecility of his organs, but which however were sufficient to effect the fall and renewal of his horns, as it was evident when he was killed that he had had horns annually from the second to the sixth year." These observations strongly prove the justness of our former remarks upon the renovation of the horns of the stag.

In remarking on the Norwegian stags, Pontoppidan says, "they are only in the dioceses of Bergen and Drontheim, and that they have been seen to swim in numbers across the straits, from the continent to the adjacent islands, resting their heads upon each other's cruppers, and when those who lead are fatigued they retire behind, and the most vigorous take their places."

Some attempts have been made to render our stags domestic, by treating them with the same gentleness as the Laplanders do their rein-

rein-deer; upon which subject M. le Vicomte de Querhoënt has informed me of the following fact: "The Portuguese first brought stags to the Isle of France, and although they took their origin from those of Europe, they were small and their colour grey; there were great numbers of them upon the island when the French took possession of it; they destroyed many of them, but a great proportion secured themselves in the most retired places; these by degrees have become quite domestic, and some of the inhabitants keep them in large flocks."

There is a small kind of stag at l'Ecole Vétérinaire, which I have seen, and which is said to have come from the Cape of Good Hope. It was spotted with white, somewhat like the axis, and was called the hog stag, merely, as it should seem, because its legs were shorter, and it was not so agile as the common kind. The length of this from the muzzle to the extremity of the body, was only three feet four inches; its legs were short, and its feet and hoofs small; it was yellow with white spots, black eyes, and black hair on the upper eyelid; the nostrils were also black, as were the corners of the mouth; the head was nearly of the same colour as the belly, and it had large ears, white on the in and yellow on the outside.

outside. Its horns were above eleven inches long and ten lines thick. Its back was dark brown, its tail was yellow above and white beneath, and its legs were of a brownish black. From all which it appears this animal approaches nearer to the species of the stag than to the fallow-deer.

THE FALLOW-DEER.*

NO two animals can make a more near approach to each other than the stag and the fallow-deer, and yet no two animals keep more distinct, or avoid each other with more fixed animosity; they never herd or intermix together, and consequently never give rise to an intermediate race. It is even rare, unless they have been transported thither, to find fallow-deer in a country where stags are numerous. They seem to be of a nature less robust and less rustic than the stag; are less common

* In Greek $\pi\rho\delta\zeta$; in Latin *dama*; in French *le daim*; in Italian *daino*; in Spanish *duino*; in German *däm-birch*; in Swedish *dof*, *dof biert*; in Polish *lanii*.



FIG. 56

Female Fallow Deer.



FIG. 57

Fallow Deer.

Engraved Oct. 20 1791 by J. S. P.

common in the forests, but are kept in parks, where it may be said they are half domestic. They abound more in England than in any other country in Europe; and there the people are extremely partial to their venison. The dogs also prefer the flesh of this deer to that of all other animals; and having once tasted it, they will quit the chase of the stag or roe, when they come across the track of a fallow-deer. There are some of them in the neighbourhood of Paris, in some provinces of France, Spain, and Germany, as also in America, where probably they have been carried from Europe. It seems to be an animal formed for a temperate climate, for there are not any in Russia, and are rarely met with in Sweden, or any other northern country. Stags are much more generally diffused. They are found throughout Europe, even in Norway, and over all the north, Lapland, perhaps, excepted; in Asia, especially in Tartary, they are numerous, as well as in the northern provinces of China. They are likewise found in America; for those of Canada differ only from ours in the height of their horns, and in the direction of their antlers, which is sometimes not straight forward, as in the heads of the common stags, but turned backward by a very evident inflection;

tion; but this form of the horns is not confined to the Canadian stag, as it is nearly the same in the Corsican stags; and some that came from Russia and Germany, have a kind of crown at the summit of their antlers, but these are only varieties, and not different species. There are large and small stags in America as well as in Europe, and yet, however diffused their species may be, they seem to be confined to cold and temperate climates. The stags of Mexico, and other parts of South America; those of Cayenne; those called stags of the Ganges, which are spoken of by M. Perault, under the name of the Sardinian hinds; those to which travellers have given the appellation of Cape stags; those of Guinea, and other warm countries, belong not to the common species, as will appear from the particular history we shall give of each of those animals.

As the fallow-deer is less savage, more delicate, and indeed more domestic than the stag, he is also subject to a greater number of varieties. Besides the common and white fallow-deer, we know of several other kinds, as those of Spain, which are almost as large as stags, but whose necks are more slender, their colour darker, their tails black underneath, and longer than those of the common deer; those
of

of Virginia, which are almost as large as those of Spain, and are remarkable for the size of their genital organs. There are others with compressed foreheads, whose ears and tails are longer than those of the common fallow-deer, and who have the hoofs of their hind legs marked with a white spot; others are spotted or streaked with white, black, or yellow, and there are others entirely black, all of which have their horns more flat, broad, and are better furnished with antlers than those of the stag, they likewise incline more inwardly, and are more palmated at the points. Of the common fallow-deer the tail is longer than that of the stag, and its hair is lighter. The horns of the buck, like those of the stag, are shed every year, and are nearly the same time in being renewed; but as this change happens later, so is their rutting season, by from fifteen days to three weeks later than that of the stag. They are neither so furious at this time, nor exhaust themselves so much by the violence of their ardour: they never quit their own pastures in search of the females, though they will dispute and fight furiously for the possession of them. It often happens, that when there is a great number in one park they will divide into two parties and engage each other with

with much resolution : these contests generally occur from a wish they both have of grazing upon some particular spot. Each of these parties has its own chief, namely, the oldest and strongest in the herd. These lead on to the engagement, and the rest follow under their direction. Their combats are singular, from the conduct by which their efforts seem to be regulated ; they attack with order, and support the assault with courage ; mutually assist each other, retire, rally, and never yield the victory upon a single defeat ; for the battle is daily renewed till the weakest party are quite defeated, from which time they are obliged to retire to some secluded part of the park, and be contented with the worst pasturage. They love elevated and hilly countries. When hunted they do not fly far before the hounds, like the stag, but study entirely how to escape from the dogs by stratagem ; when pressed and heated they will plunge into the water, though it is very rare that they will take to a great river. In the chace, therefore, between the fallow-deer and the stag, there is no essential difference ; their instincts and artifices are the same, though more put into practice by the former ; which, together with the lightness of his step, render it more difficult for the dogs to avoid being deceived.

The

The fallow-deer is easily tamed and feeds upon many things which the stag refuses ; he also preserves his venison better ; nor does it appear that the rutting, followed by a long and severe winter, exhausts him, but he continues nearly in the same state throughout the year. He browses closer than the stag, for which reason he is more prejudicial to young trees, and often strips them too close for recovery. The young deer eat faster and with more avidity than the old. At the second year they seek the female, and, like the stag, are fond of variety. The doe goes with young eight months and some days ; she commonly produces one fawn, sometimes two, but very rarely three. They are capable of engendering at the age of two years to that of fifteen or sixteen ; and in fine, they resemble the stag in all his natural habits, and the greatest difference between them is the duration of their lives. From the testimony of hunters it has been remarked that stags live to the age of 35 or 40 years, and from the same authority we understand that the fallow-deer does not live more than 20. As they are smaller than the stag, it is probable that their growth is soon completed. In all animals the duration of life is proportioned to, that of the growth, and not to that of gestation, for

here the gestation is the same; and in other species, as the ox, though the time of gestation be long, that of the duration of life is very short; whence it follows that we ought not to calculate the duration of life by the time of gestation, but by that which Nature has required for perfecting the growth, reckoning from the birth to the almost entire expansion of the body.

THE ROE-EUCK.*

THE stag, as being the noblest inhabitant of the wood, occupies the most secret shades of the forest, and the elevated parts of mountains, where the spreading branches form a lofty covert; while the roe-deer, as if an inferior species, contents himself with a more lowly residence, and is seldom found but among the thick foliage of young trees. But if he is less

* In French *chevreuil*; in Greek *δορυκός*; in Latin *capreolus*, *capriolus*; in Italian *capriolo*; in Spanish *zorlito*; in Portuguese *cabra montes*; in German *rebe*; in Swedish *radiur*; in Danish *raa diur*.

less noble, strong, and elevated in stature than the stag, he has more grace, vivacity, and courage; and when the fawns are attacked, he will defend them even against the stag himself. He is more gay and active, his shape is more agreeable and elegant; his eyes are more brilliant and animated; his limbs are more supple; his movements quicker, and with equal vigour and agility he seems to bound without effort. His hair is always clean, smooth, and glossy; he never rolls in the mud like the stag; he frequents the dryest and most elevated places, where the air is the most pure; he has also more cunning and finesse; he is more difficult to chace, and derives a greater number of resources from his instinct. Though he has the disadvantage of leaving a stronger scent behind him than the stag, which excites in the dogs a greater degree of ardour, he knows better how to avoid their pursuit by a rapid flight and repeated doublings; for he does not, like the stag, delay the application of art till his strength begins to fail him; but even in the first instance, when he finds his efforts of speed are not likely to save him, he immediately begins to retrace his former steps, and continues going backwards and forwards till, by his various windings, he has confounded the scent and joined the last emanations to those of his former course;

course ; having done which, by a great bound he withdraws to one side, lies flat upon his belly, and suffers the whole pack to pass close by him without attempting to move.

The roe-buck differs also from the stag in his natural appetites, inclinations, and whole habits of living. Instead of herding together, they live in separate families ; the sire, dam, and young, form a little community, and never admit a stranger into it. All other animals of the deer kind are inconstant in their amours, but the roe-deer never forsake each other. As the females generally produce two fawns, one of each sex, they are brought up together, and acquire an attachment so strong, that they never separate, unless by some misfortune. This attachment is something more than love, for though they are always together, they do not feel the ardour of the rut more than fifteen days in the year, that is, from the end of October to about the middle of November. They are not at that time like the stag, overloaded with fat ; they have no strong smell, no fury, nothing, in short, which alters their state ; the only observable difference is, that they drive away their fawns ; the buck forcing them off to make room, as it were, for a succeeding progeny. When the rutting season is over, however, the fawns return to their
their

their dams, and remain with them some time, after which they quit them entirely to form separate families of their own.

The female goes with young five months and a half, and brings forth about the end of April or beginning of May. The hinds, as already observed, go more than eight, which is alone sufficient to prove their difference of species, that they can never intermix, nor produce an intermediate race. In this respect, as well as in figure and make, they approach the species of the goat, as much as they recede from that of the stag ; for the goat goes with young nearly the same time, and perhaps the roe-deer ought to be regarded as a wild goat, which, by feedingsolely on trees, carries branches on his brows instead of horns. When about to bring forth, the female separates from the male, and conceals herself in the deepest recesses of the woods, to avoid the wolf, who is her most dangerous enemy. At the expiration of ten or twelve days, the fawns attain sufficient strength to follow her. When threatened with any danger, she hides them in some deep thicket, and by way of preserving them presents herself to be chased. But all her care is not sufficient to secure them from being frequently carried off by dogs and wolves. This is indeed their most critical

critical time, when this species, which is not very numerous, suffers the greatest destruction, as I have found by experience. I often reside in a part of the country (Montbard in Burgundy) famous for roe-bucks, and where not a spring passes without a great number being brought me, some taken alive by men, and others killed by dogs; insomuch that, without counting those killed by wolves, I am convinced more are destroyed in the month of May than in all the rest of the year; and I have observed, for more than twenty-five years, that as if there subsisted a perfect equilibrium between the causes of destruction and renovation, their number is nearly the same in the same districts. It is not difficult to count them, as they are nowhere very numerous, and keep together in separate families, and distinct from that of any other. In a coppice, for example, of 100 acres in circumference, there will be found one family, or from three to five individuals, for the females will sometimes have but one fawn, and at others three, but either case seldom happens; in another district more extensive, there will be seven or eight, that is two families; and I have remarked that in each district their numbers have been uniform, excepting in those years when the winters have been remarkably severe;

in that case the whole family is destroyed, but by the next year it is succeeded by another ; and those districts to which they give the preference are always stocked with nearly the same quantity of them. Notwithstanding this, it is asserted, that this species, upon the whole, is diminishing in number ; and, indeed, it is true, that there are provinces in France where not one of them is to be found ; that though common in Scotland there are none in England ; very few in Italy, and they are more scarce in Sweden than formerly, &c. But these effects might arise from the diminution of forests, or from the excessive rigour of some winters, like that of 1709, by which they were almost all destroyed in Burgundy, and a number of years elapsed before they were renewed. Besides they are not equally fond of every country, and even in the same country they are partial to particular spots. They love hilly grounds, and never remain in the deep recesses of extensive forests, but prefer the skirts of those woods which are surrounded with cultivated fields, and open coppices, where the brambles, buck-thorn, &c, grow in plenty.

The fawns continue with the old ones eight or nine months, and soon after separating their horns begin to appear, simple knobs without antlers ;

antlers; these they shed at the latter end of autumn, and have them renewed during the winter; differing in this from the stag, who sheds them in spring, and renews them in the summer. Several causes contribute to produce these different effects. In summer, the stag takes a great quantity of nourishment, and grows very fat; in the rutting season he exhausts himself so much that the whole winter is not more than sufficient to effect his recovery. At this time, so far from there being a superabundance of nourishment, he experiences an absolute scarcity, and of course his horns cannot sprout till spring, when his nourishment is again superabundant. The roe-buck, on the contrary, who never exhausts himself so much, has less occasion for repair; and as he is never incumbered with fat, nor any change is made in him during the time of the rut, being always nearly the same, so he has, at all times, the same superfluity; so that even in winter, and soon after the rut, he sheds and renews his horns; and it appears that these productions, which may be termed vegetable ones, are formed of an organic and superfluous matter, though still imperfect, and mixed with inanimate particles; since in their growth and substance they preserve the vegetable qualities
whereas,

whereas the seminal fluid, whose production is not so early, is a matter altogether organic, divested of inanimate particles, and assimilated to the body of the animal. When the roe-buck has completely repaired his horns, he rubs them against the trees in the same manner as the stag, in order to strip them of the skin with which they are covered: and this he generally does about March, before the trees begin to shoot; hence it is not the sap of the wood which tinges the horns of the buck; yet they are brown in those that have brown hair, and yellow when the animal is red, consequently the colour of the horns arises solely, as has already been remarked, from the nature of the animal, and the impression of the air. The second horns of the roe-buck have generally two or three antlers on each side; the third have three or four; the fourth, five; and they seldom have more; and the old ones are distinguished by the thickness of their stems. While their horns are soft they are extremely sensible of pain. Of this I witnessed a striking proof. With a ball from a gun the young shoot of a roe-buck's horn was taken clear off, and by which he was so stunned that he fell down as if he were dead; the shooter, who was near, seized him by the foot, but the animal

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suddenly recovering his strength and feeling, dragged the man, though very strong and vigorous, above thirty paces, till he dispatched him with a hanger ; it was then found that he had received no other wound than that of the hanger, and what the ball had made in striking the horn. It is also well known that flies are intolerable tormentors to the stag ; while his horns are growing, he withdraws to the thickest covert of the wood, where the flies least frequent, because the irritation is insupportable when they fix upon the tender horns. Thus there is an intimate communication between the soft part of this living wood, and the whole nervous system of the animal. The roe-buck, who has nothing to fear from these enemies, as he renews his horns in the winter, does not retire in this manner, but he walks with caution, and holds his head low for fear of striking it against the branches. In the stag, fallow-deer, and roe-buck, there are two bony eminences on which their horns grow ; these begin to shoot at the end of five or six months, and soon arrive at their full growth ; instead of enlarging as the animal advances in age, they diminish every year, and are the most certain marks for distinguishing the age of all the species. I think
it

it is easy to account for this effect, which at first appears so singular, but which ceases to be so when we reflect, that the horns which grow upon this eminence must press upon it during the whole time of their growth, which is for several months in the year; therefore, however hard they may be they must continually lower and contract by the compression which is reiterated every time the roe-buck repairs his horns. This is likewise the reason that, though the trunk continues to increase in thickness as the animal advances in years, yet the height of the horns, and number of branches, diminish so much, that when he arrives at a great age there remain only two large prickets, or fantastic and ill-shaped knobs.

As the female goes only five months and a half with young, and as the growth of the fawn is more rapid than that of the young stag, so is his life much shorter; and I do not believe it ever extends beyond twelve or fifteen years. I have reared several, but could never keep any above five or six years. They are very delicate in choosing their food, require much air, exercise, and space to range in, which is the reason they cannot sustain the inconveniences of a domestic life, but in their younger years; for a roe-buck to live at his
ease

ease and comfortable, he must be supplied with a female and a park of at least an hundred acres to range in. They may be tamed, but can never be rendered obedient or familiar; they always retain somewhat of their wild nature, are easily terrified, and will then run against a wall with such force as sometimes to break their legs. However tame they may be, they are not to be trusted, for the bucks are apt to adopt many caprices; they will take an aversion to particular persons, and run at them with their horns with a force sufficient to knock a man down, and having done so, they will continue to trample on him with their feet. The roe-buck does not cry so frequently, nor with so strong a voice as the stag. The young ones have a short and plaintive cry, their note being *mi, mi*; which they generally use when they are in want of food. This note is easily imitated, and by using it the dams may be brought to the very muzzle of the hunter's gun.

The roe-bucks remain in winter in the thickest coppices and feed on briars, broom, heath, &c. In spring they repair to the more open brush-wood, and browse upon the buds and young leaves of almost every tree: this warm food, fermenting in their stomachs, inebriate them to such a degree that they are then easily

easily surprised ; for they know not whither they go ; frequently come out of the woods, will approach flocks of cattle, and even the habitations of men. In summer they inhabit the more lofty coppices, from which they seldom issue, except in extreme heats to drink at some cool fountain ; for when the dew lies in quantities, or the leaves are moistened with rain, they never drink. They select the choicest kinds of aliment, being extremely delicate in their eating, neither feeding with the same indifference nor avidity as the stag, and seldom approaching cultivated ground. The flesh of these animals is excellent food, yet there is much distinction to be made in the choice of the venison. The quality depends greatly upon the country in which they have lived ; although in the most plentiful, both good and bad are to be found. The flesh of the brown roe-buck is more delicate than that of the red : that of those which have passed the second year is tough and ill-tasted, while that of the females, though further advanced in years, is more tender. Those which are bred in plains and valleys are not good ; those from moist lands still worse ; there is but little taste in those reared in parks, and, in a word, there are no good roe-bucks but those which have inhabited dry and elevated countries,

countries, interspersed with little hills, woods, arable lands and streams, where they have a sufficiency of good air, food, freedom, and above all, solitude; for such as have been often disturbed are thin, and the flesh of those which have been frequently hunted previously, is tasteless and insipid.

This species, which is not so numerous as that of the stag, and seldom found in many parts of Europe, is much more abundant in America, where there are but two sorts; the red, which are large, and a brown one considerably smaller, which has a white spot behind; and as they are found both in the northern and southern parts of America, it is probable that they differ more from each other than from those in Europe. In Louisiana* they are extremely common, and are larger than those in France. They are also found in Brasil; for the animal which is there called *Cujuacu-apara*, differs not more from the European roe-buck, than the Canadian stag from ours. There is only some little variation in the form of the horns. "In Brasil, says Piso, there are two sorts of the roe-buck, one of which has no horns, and is called

* They make great use of the flesh of the roe-buck in Louisiana; it is larger here than in Europe, and has horns like the stag, but differs from it in its hair and colour; the inhabitants use it the same as other people do mutton.

called the *Cujuacu-été*, and the other is furnished with horns, and is called *Cujuacu-apara*. The horned ones are much less than the others; their hair is smooth, glossy, and a mixture of brown and white, when they are young, but the white is lost as they advance in years. The hoof is divided into two black toes, upon each of which there appears to be grafted another and smaller one; the tail is short, the eyes large and black, the nostrils open, the horns are of a middling size, and fall off annually. The females go five or six months with their young;" and another author adds, "that their horns are divided into three branches, and that the lowest branch is the longest, and divides into two." We may fairly conclude from the above descriptions, that the *apara* is a variety of the species of the roe-buck; and Ray supposes that the *Cujuacu-été* and the *Cujuacu-apara* are both of the same species, and that one is the male and the other the female. I should acquiesce in this opinion, if Piso had not expressly stated, that those which have horns are smaller than the others; for it does not appear probable that the females should be so much larger than the males, when in every other place the contrary is the case. At the same time, although the *Cujuacu-apara* may be nothing
more

more than a variety of our roe-buck, to which the *capreolus marinus* of Johnson may be added, I cannot pretend to determine with respect to the *Cujuacu-été*, at least until we have received more certain information.

SUPPLEMENT.

IN my original work I remarked, that wild animals were generally either white, brown, or grey; and that such as fallow-deer, rabbits, &c. became white, from being kept in a domestic state, but M. l'Abbé de la Viletta, in a letter dated June 17, 1773, informs me, that they are sometimes so in their natural state; for a man belonging to his brother, who had an estate near Orgelet, in Franche-comté, brought home two old roe-deers, one of which was of the common colour, and the other a female perfectly white, having only black hoofs, and a black spot at the end of her nose.

M. de Fontenelle, the king's physician, at New Orleans, in a letter to me, says, that "roe-bucks are very common in North America, that they entirely resemble those of Europe, except

except being somewhat larger, particularly in Louisiana, where he thinks they are nearly as big again as those in France. He says they are very easily tamed, as does M. Kalm, who asserts, that he had a roe-buck which went every day to the woods, and returned to his house regularly every night. According to M. de la Borde, there are four kinds of stags at Cayenne, indiscriminately called hinds, whether males or females. “ The first are called wood, or red hinds, which constantly inhabit the thickest part of the forests. The second, which are bigger, though of the same colour, are called the barallou hind; both of these species have two considerable glands on each side of the nostrils, containing a white foetid humour. The third is called the Savanna hind, which is of a grey colour, and more common than either of the others; neither are they so large, though their horns are longer and more branched: they are called Savanna hinds, because they seek out the lands covered with marshes; they feed upon the manioc, and are very destructive to plantations. Their flesh is excellent food, and far preferable to that of European stags. They are so tame at Cayenne, that they run about the streets, and go in and out of town without discovering the

smallest degree of apprehension. The females are said even to go into the woods after wild males, and to return again when they have got fawns. The last is called the caricou; he is less than either of the others, his colour is a light grey, and his horns are straight and pointed. He keeps himself entirely to large woods, and never ventures near parts that are inhabited; they are, nevertheless, very easily rendered tame and familiar; and the females produce but one fawn at a time." Notwithstanding the stress which has been laid upon these remarks, I am of opinion, that all these pretended species of stags or hinds, as above described, are merely varieties of the roe-buck, which are more numerous in the new than in the old continent, and which I apprehend will fully appear to such as compare those descriptions with our history of the mazame, or Mexican deer.

THE HARE.*

THE species of animals which are most numerous are not the most useful. Nothing can be more noxious than the multitudes of rats, mice, locusts, caterpillars, and many other insects, of which it would seem that Nature rather admitted than ordained the extraordinary increase. But those of the hare and rabbit are advantageous to us both from the number and utility. Hares are abundantly spread over the face of the earth; and rabbits, though originally natives of particular climates, multiply so prodigiously in almost every place to which they are transported, that instead of being extirpated, no small art is required in order to diminish their too-often inconvenient number. When we reflect on the astonishing fecundity of each particular species, on the quick and prodigious multiplication of certain animals which

* In French *le lievre*; in Greek *λαγώς*; in Latin *lepus*; in Italian *lepre*; Spanish *liebre*; Portuguese *lebre*; German *hase*; Swedish *bare*; Dutch *hase*; Polish *lajoncz*;

which come into existence, as it were, to desolate the fields and ravage the earth, we are astonished they do not oppress Nature with their numbers, and after having devoured her productions become themselves victims to the destruction they have made. We cannot view without terror those thick clouds, those winged phalanxes of famished insects which seem to menace the whole globe, and whether lighting on the fruitful plains of Egypt, or of India, in an instant destroy the labours and hopes of a whole people; and sparing neither grain, fruit, herbs, nor leaves, strip the earth of its verdure, and change the richest countries into barren deserts. We behold rats descending from the northern mountains, in innumerable multitudes, rushing like a deluge of living matter, overflow the plains, spread themselves over the southern provinces, and after having destroyed in their passage every thing that lives, or vegetates, finish their career with infecting the earth and air with their putrid carcasses. We behold in the southern regions myriads of ants issuing from the deserts, which, like an exhaustless torrent, arrive in thick and successive columns, take possession of every spot, drive away men and animals from their habitations, and never retire till they have caused a
general

general devastation. And in those times when man himself was but half civilized, and subject to all the laws and even excesses of Nature, were there not similar inundations of the human species? Have there not been Normans, Huns, and Goths, whole nations, or rather tribes of animals bearing the human form without dwellings, and without distinction, who have suddenly rushed from their caves, and marched in tumultuous herds, and without any force but what consists in numbers, overthrown empires, destroyed nations, and having ransacked the earth, concluded by repeopling it with a race not less barbarous than themselves?

These æras, these great events, though so strongly marked in the History of Mankind, are yet only slight vicissitudes in the ordinary course of animated nature, which is in general always uniform and the same; its movements are regulated by two unchangeable wheels; the one, unbounded fecundity of every species; the other, the innumerable causes of destruction which are perpetually reducing the produce of that fecundity to a determinate measure, so as to preserve nearly the same number of individuals in each species. And as these multitudinous animals, which appear suddenly, disappear in the same manner, without aug-
menting

menting their race, so does the human species always remain the same ; the variations only are more slow, because the life of man being longer than that of small animals, the alternate changes of increase and diminution must necessarily require a greater portion of time. But time itself is only an instant in the succession of ages, and only strikes us the more forcibly, from having been accompanied with horror and destruction ; for, taking all the inhabitants of the globe together, the number of the human race, like that of other animals, will, at all times, appear to be nearly the same ; as this depends entirely upon an equilibrium of physical causes, an equilibrium to which every thing has long been reduced, and which neither the efforts of man, nor any moral circumstances whatever, can dissolve ; those circumstances themselves being dependant on physical causes. Whatever care man may bestow on his own species, he will never be able to render it more numerous in one place without destroying or diminishing it in another*. As soon as any

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* We were at first inclined to combat this position of our learned author, with those reasons, founded upon facts, which may be adduced against it ; but he has himself so completely replied to it at the end of his dissertation upon wild animals,

one country is overstocked with inhabitants they diffuse themselves over other countries, or destroy each other, and not unfrequently establish laws and customs calculated to prevent an excess of multiplication. In climates of exuberant fertility, as China, Egypt, and Guinea, they banish, mutilate, drown, or sell their infants; in Catholic countries they condemn them to perpetual celibacy. Those who actually exist find no difficulty in arrogating to themselves the disposal of the rights of those who have no existence. Considering themselves as necessary, they annihilate contingent beings, and scruple not to suppress future generations for their own ease and convenience. Mankind, without perceiving it, treat their own species exactly in the same manner as they do other animals; they cherish and multiply, or neglect and destroy them, according as it suits their purpose; and as all moral effects depend upon physical causes, which ever since the earth assumed its form, are fixed and permanent, it follows that in the human, as well as in the
other

page 26 of this volume, that any thing further than repeating his own observation must be unnecessary; for he there says, that, "*in process of time, we may reasonably suppose the surface of the earth will be equally inhabited,*" which is surely impossible without considerable increase.

other animal species, the number must likewise be uniform and unalterable. It is to be observed that this fixed state, this permanent number, are not to be considered in an absolute sense; all physical and moral causes, and all the effects which flow from them, are comprised and balanced within certain limits, more or less extended, but never so large as to destroy the equilibrium. As the whole universe is in a state of perpetual motion, and as all the forces of matter act against and counter-balance each other, so every thing is brought about in a kind of oscillation, to the middle points of which we refer the ordinary course of Nature, and whose extremes are the furthest removed from that course. In effect, therefore, we find that an excess of fecundity, either in animals or vegetables, is the usual fore-runner of sterility. Plenty and scarcity present themselves so alternately, and often follow so close upon each other, that a tolerable judgment may be formed of the product of one year by that of the preceding. The apple, plum, oak, beech, and indeed most fruit and forest trees, do not bear plentifully two years together. So likewise it is with caterpillars, May-bugs, flies, field mice, and many other animals, who if they multiply to excess one
year

ear, they will produce but a very small number the next. What, indeed, would become of all the fruits of the earth, of the most useful animals, or even of man himself, if these insects were to be proportionally increased after a fertile season? But no; the causes of destruction and sterility immediately follow those of an excessive multiplication. Independent of contagion, a necessary consequence of too great a mass of living matter assembled in one place, there are in every species, certain causes of death, as we shall hereafter have occasion to mention, and which are sufficient to counterbalance any preceding excess of fecundity. I must again observe that this is not to be taken in an absolute or strict sense, especially with respect to those species which do not remain entirely in a state of nature. Those which man takes care to rear are more abundant than they otherwise would be; but as his attention has its limits, so the increase which flows from it has long since been confined by unalterable bounds; and though in civilized countries, the human species and domestic animals, are more numerous than in other climates, they are never so to excess; because the very power which calls them into existence, destroys them when they become troublesome.

In those districts which are reserved for the chase, four or five hundred hares are sometimes killed in the course of one day's sport. These animals multiply amazingly; they engender at all seasons, and are in a condition to propagate before the first year of their life is expired. The females do not go with young above thirty or thirty-one days; they produce three or four, and are immediately after ready to receive the male; they likewise receive him during the time of gestation, and by a particular formation of their organs are often found to have a super-foetation; for the vagina and the matrix are continuous, and the latter has neither neck or orifice in the womb, as in other animals; yet each horn has an orifice which opens into the vagina and dilates during the time of bringing forth; and which forming two distinct uteri, act independently of each other; so that the females of this species are capable of conceiving and bringing forth by each matrix at different times; and consequently super-foetation must be as common among these animals, as it is rare among those which have not this double organ. It is plain, therefore, that the females may be impregnated at all times. By another singularity in their conformation they are found to be as lascivious as they

they are fruitful; the gland of the clitoris is prominent and almost as large as the sexual distinction of the male; and as the vulva is hardly visible, and the males when young have no exterior marks, it is often difficult to distinguish the sexes. It is these circumstances which have given rise to the opinions that there are many hermaphrodites among these animals, that the males sometimes bring forth, and that some are alternately males and females, and perform the office of either sex; because the females being more lascivious than the males will get upon them, and because they so much resemble each other externally, that unless very closely examined one sex may be mistaken for the other.

The young ones have their eyes open when brought forth; the mother suckles them about twenty days, after which they separate and provide for themselves; they do not wander far from each other, nor from the place of their birth; yet they live in solitude, each composing itself a form at the distance of sixty or eighty paces; thus when we find a leveret in any place, we are almost certain of finding one or two more in the neighbourhood. They feed more by night than day; and chiefly upon herbs, leaves, fruits, and grain, but above all they prefer those plants which yield a milky juice; they even
eat

eat the bark of trees in winter, except that of the alder and lime, neither of which they ever touch. When reared at home they are fed with lettuces and other herbs ; but the flesh of these domestic fed hares has always a bad taste. They sleep and repose themselves in their forms during the day, and only live, as it were, in the night, when they range about, feed, and copulate ; they may be seen by moonlight playing, leaping, and pursuing each other, but the smallest noise, even the rustling of a falling leaf is sufficient to alarm them ; they fly, and in their flight take different ways.

Some authors have asserted that hares chew the cud ; but I cannot believe this opinion to be well founded, as they have but one stomach, and the conformation of that, as well as the other intestines is altogether different in ruminating animals. The cœcum of the latter is small, while those of hares are extremely large ; and if we add to the capacity of the stomach this large cœcum, we shall easily conceive, that being capable of receiving a great quantity of food, this animal may live upon herbage alone, like the horse and the ass, which have also a large cœcum and but one stomach, and consequently cannot ruminate.

Hares

Hares sleep much, but always with their eyes open. They have neither eye-lids, nor cilia, and seem to have bad eyes; but as if for a recompence of that defect, their hearing is exceedingly acute, and their ears are very large in proportion to the size of their bodies. They move these long ears with great facility, and use them as an helm to direct their course, which is so rapid that they easily outstrip all other animals. Their fore legs being much shorter than their hind ones they can more easily mount than descend, for which reason when pursued they always make towards the rising grounds. Their running is a kind of leaping gallop, and they proceed without making the smallest noise, as their feet, even underneath, are covered with hair, and perhaps they are the only animals which have hair growing within side of their mouths. The hare does not live above seven or eight years; he completes his growth in one, and the duration of its life is proportioned to this period, for he lives to about seven times that space. Some indeed assert that the males live longer than the females, but that I much doubt. They pass their lives in solitude and silence, and never exert their voices but when seized or wounded; their cry is sharp and strong, and not unlike the human

human

human voice. They are not so savage as by their habits and manners might be supposed; they are gentle, and susceptible of a species of improvement. They are easily tamed, but never acquire that degree of attachment which is requisite to render them domestic, for those which are taken very young, and brought up in a house, will take the first opportunity to escape and fly into the country. As they have a good ear, as they sit of their own accord upon their hind legs, and use the fore legs like arms, some have been so tutored as to beat a drum, to perform gestures in cadence, &c.

In general the hare possesses sufficient instinct for its preservation, and sagacity to escape its enemies. It prepares itself a form, or nest; in winter he chuses a spot exposed to the south, and in summer one to the north. To conceal himself from view he hides among hillocks of the same colour with his own hair. "I have seen," says du Fouilloux, "a hare so cunning, that upon hearing the huntsman's horn he started from his form, and though at the distance of a quarter of a league, hasted to a pond, and there hid himself among the rushes in the middle of it, and thus escaped the pursuit of the dogs. I have seen a hare, which after running more than two hours before the dogs,

dogs, has dislodged another, and took possession of his form. I have seen others, swim over two or three ponds, of which the smallest was not less than eighty paces broad. I have seen others, after a chase of two hours, enter a sheep cot, and remain among the cattle. I have seen others, when closely pursued, take refuge among a flock of sheep, from which they would not be separated. I have seen others, upon hearing the noise of the hounds, conceal themselves in the earth. I have seen others, which have gone along one side of the hedge, and returned by the other, so that there was only the thickness of the hedge between them and the dogs; and I have seen others, after a chase of half an hour, mount an old wall six feet high, and take refuge in a hole covered with ivy." But these facts are doubtless the greatest efforts of their instinct, for their common resources are less refined and intricate. They, in general, when pursued, content themselves with running rapidly, and afterwards tracing and retracing their own steps. They never direct their course against the wind, but always run with it. The females do not run so far out as the males, but they double more frequently. Hares, in general, if hunted upon their native spot, do not
remove

remove a great way from it, but return to their form, and if chased for two successive days, they make exactly the same doublings on the second as they did on the first. If a hare runs straight forward, and to a great distance, it is a proof of his being a stranger to that spot, and that he was only there by accident. This generally happens during their most particular times of rutting, which are in January, February, and March, when the male hares finding but few females in their own districts, will roam for several leagues in search of them; but immediately upon being roused by the dogs, they make towards their native abodes, and never return again. The females do not thus go abroad; they are larger than the females, but have less strength and agility, and are more timid, for they never allow the dogs to come so near their forms as the males, and make use of more doublings and artifice. They are also more delicate, and more susceptible of the impressions of the air; they dread the water, and even avoid the dews; whereas among the males there is a kind which are fond of water, and are chased in marshy and watery grounds, but the flesh of this sort has a very bad taste; and, in general, the flesh of all those which inhabit low valleys is whitish and insipid, while those in elevated countries, where
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the wild thyme, and other fine herbs abound, are delicious to the palate. It has also been remarked, that those which live in the centre of the woods, even in the same countries, are not so good as those that inhabit the borders, or live among the cultivated fields and vineyards ; and that the flesh of the female is always more delicate than that of the male.

The nature of the soil has a great influence on hares, as well as on all other animals. The hares of the mountains are larger and fatter than those of the plains, and are also of a different colour, the former being browner, and having more white under the neck than the latter which are inclined to red. On high mountains, and in northern countries, they become white in winter, and recover their ordinary colour in the summer ; there are but a few, and those perhaps very old ones, that continue always white, for all of them change more or less white as they advance in years.

The hares of Italy, Spain, Barbary, and other warm climates, are smaller than those of France and more northern nations ; and according to Aristotle they were of a less size in Egypt than in Greece. They are exceedingly plentiful in Sweden, Poland, France, England, Germany, Barbary, Egypt, the Islands

of the Archipelago, particularly Delos, which was formerly called Lagia, from the number of hares found in it. They are also plenty in Lapland, where they continue white for the whole ten months of the winter, and resume their yellow colour during the two months of the summer only. It appears then that all climates are nearly equal to them. However it is observed that they are less numerous in the eastern countries than in Europe; that there are scarcely any in South America, though they are numerous in Virginia, Canada, and even in the land that borders on Hudson's Bay, and in the Straits of Magellan. But these North American hares are perhaps of a different species from ours, for travellers tell us, that they are not only larger but that their flesh is white, and has a very different taste to that of the European hares. They add, that in North America these animals never shed their hair, and that their skins make excellent furs. In countries of excessive heat, as Senegal, Gambia, and particularly in the districts of Fida, Apam, and Acra; and in other countries situate under the torrid zone in Africa, and America, as New Holland, and the isthmus of Panama, there are also animals which travellers have taken for hares, but which seem rather to be a species of rabbit,

rabbit, which comes originally from the hot countries, and is never found very far to the north; whereas the hare is always fatter in proportion to the coldness of the country which he inhabits.

The flesh of this animal, though so much esteemed at the tables of Europeans, is not at all relished by the eastern nations. It is true that the flesh of the hare, as well as that of the hog, was forbidden as food by the law of Mahomet and the ancient Jewish law; but the Greeks and Romans held it in as great estimation as we do, "*Inter quadrupedes gloria prima lepus*," says Martial. In fact, both the flesh and the blood of this animal is excellent; but the fat adds nothing to the delicacy of the flesh; for the hare, when at its liberty in the open country, never grows fat; whereas he often dies with the excess of it when reared in a house.

The chase of the hare is an amusement, nay often the principal occupation of people in the country. As it requires but little apparatus and expence, and is even useful, it is an amusement universally agreeable. The hunter in the mornings and evenings watches at the corner of some wood for the hares going out or returning; and in the day he seeks to dislodge them from their form. When the air is fresh and the

sun shines bright, a hare, which has been chaced, may be discovered on its form by the fumes which arise from its body; and I have seen some so expert in this observation that they have gone half a league to kill a hare on its seat. This animal will suffer itself to be very nearly approached, especially if the advance is made with a seeming inattention and obliquity. They are more afraid of dogs than men, and upon either smelling or hearing the former will immediately take to flight; though they run swifter than the dogs, yet as they do not take a direct course, but turn and double round the spot from whence they were started, the greyhound, who rather hunts by sight than smell, generally intercepts, seizes, and destroys them. They remain in the fields during the summer, in autumn among the vines, and in winter among the bushes or in the woods, and in all seasons they may be forced to the chace with proper hounds. They may be also taken by birds of prey. Owls, buzzards, eagles, foxes, wolves, and men, make continual war upon them. These animals have so many enemies, that they escape them only by chance, and are seldom allowed to enjoy that short life which Nature has allotted to them.

SUPPLEMENT.

FROM M. Hettlinger I understand, that the hares not uncommonly burrow in the clefts of the rocks among the mountains in the neighbourhood of Biagory, which is contrary to their practice in those climates, where they make forms and leave going underground to rabbits; that the former are not partial to those places where the latter are numerous, is pretty generally known; to which Pontoppidan has added the remark, that rabbits do not multiply where hares are in abundance; he says, "In Norway, rabbits are seldom met with, but hares are very numerous; they are either brown or grey, during summer, and constantly change to white in the winter; they catch mice and eat them, like cats, and are smaller than those found in Denmark." Whatever truth there may be in the other parts of his relation, their eating of mice is highly improbable, but it is not the only instance of his partiality for the marvellous.

M. le Vicomte de Querhoënt, in speaking of the hares of the Isle of France, says they are not bigger than the rabbits of France; that their hair is smoother, that they have a large black spot upon the hind part of their heads, and that their flesh is very white; and M. Adamson gives nearly a similar description of those of Senégál, excepting the black spot upon their necks.

THE RABBIT.

ALTHOUGH the hare (*fig. 58.*) and the rabbit (*fig. 59.*) are so very similar both in their external and internal conformation, yet they never intermix, but form two distinct and separate species. As hunters, however, have asserted that the male hares, in rutting time, run after and cover female rabbits, I have endeavoured to discover what would be the result of such a union. For this purpose I
caused



FIG. 58

Roebuck



FIG. 59

Female

caused some male hares to be reared with some doe rabbits ; and some male rabbits with doe hares, but these attempts were attended with no other effects than convincing me, that though these animals are so similar in form, they are so different in nature as to be incapable of producing an intermediate race. One young hare, and a young female rabbit of nearly the same age, did not live together three months ; for, having acquired a little strength, they became dreadful enemies, and their continual battles terminated in the death of the hare. Of two male hares, each of which I confined with a doe rabbit, one shared the same fate, and the other, being very strong and ardent, never ceased from tormenting the rabbit, by endeavouring to cover her, and in the end occasioned her death, either by the wounds he gave her, or by his too violent caresses. Three or four doe hares, whom I matched with male rabbits, experienced the same fate, though in a still shorter time. Though there was never any produce, yet I am pretty certain that a copulation sometimes took place ; at least that, notwithstanding the resistance of the female, the male was gratified : and there was more reason to expect a produce from this union, than that of the rabbit and hen ; of which, according to
a certain

a certain author*, the fruit would be, *chickens covered with hair, or rabbits covered with feathers!* This strange conclusion was drawn from the act of a vicious male rabbit, who being unaccommodated with a female, made use of a hen as he might have done any other moveable: nor was there the least probability to expect any product from two animals whose species were so distant, since nothing results from an union between the hare and rabbit, which seem so nearly to approach each other.

The fecundity of the rabbit is even greater than that of the hare; and without crediting Wotton's assertion, that a single pair being left upon an island, multiplied to six thousand at the end of a year; it is certain that they increase so prodigiously, in countries which are proper for their breed, that the earth cannot supply them with sufficient subsistence. They destroy herbs, roots, grains, fruits, and even young trees and shrubs; and if it were not for dogs and ferrets, they would reduce the country to a desert. The rabbit not only produces more frequently and in greater numbers than the hare, but it has more ways to escape its enemies, and to avoid the sight of man. The holes which it digs in the earth, where it retires in the day, and where it brings forth

* See a French Tract entitled, *L'Art d'Elever les Poulets.*

forth its young, protect it from the wolf, fox, and birds of prey. Here the whole family live in perfect security; here the females nourish their young, for the space of two months, nor ever conduct them abroad until they have sufficient strength to provide for themselves. By this means they avoid the dangers of their early age; while hares, on the contrary, are destroyed in greater numbers at this period, than during all the rest of their lives. This circumstance alone may suffice to prove that the rabbit is superior to the hare in point of sagacity. They are alike in their conformation, and have equal power to dig retreats. Both are equally timid; but the one, possessed of less art, is contented with forming a residence on the surface of the earth; where it remains continually exposed, while the other, by a superior instinct, digs into the earth, and secures itself an asylum; and as a proof this is the effect of sentiment, we never see the domestic rabbit taking that trouble. They neglect securing themselves retreats, from the same reason that domestic birds neglect the building of nests, because they are equally protected from the inconveniences which both species in their natural state must necessarily have been liable to. It has been often remarked, that when a warren is replenished with do-

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mestic rabbits they and their produce remain upon the surface, like hares ; and that it is not until they have experienced a number of hardships, and passed several generations, they begin to dig holes in the earth for an asylum.

The domestic rabbits, like all other domestic animals, vary in colour ; white, black, spotted, and grey, are, however, the only colours which properly belong to Nature. The black rabbits are the most scarce. The wild rabbits are all of a greyish brown, which is also the predominant colour among the tame ones ; for in every litter we constantly find brown rabbits, even though the old ones were both black or both white, or the one white and the other black. It is seldom that more than one or two will resemble such parents, whereas the brown rabbits, though domestic, seldom produce any but of their own colour, and it is, as it were, by chance, if they bring forth white, black, or mixed ones.

These animals are capable of engendering by the age of five or six months. It is asserted they are constant in their amours, and that they usually attach themselves to a female which they never forsake. The latter is always ready to receive the male ; she goes with young 30 or 31 days, and brings forth from 4 to 8 at a time.

Like

Like the doe hare she has a double matrix, and consequently may produce at two different times. It appears, however, that super-fœtations are less frequent in this species than in that of the hare, which is perhaps owing to the females being more constant, and because they copulate less out of season. A few days before bringing forth they dig a fresh burrow, not in a straight line, but in a crooked direction, at the bottom of which they make an excavation; after which they tear a quantity of hair from off their bellies, and with it make a bed for their little ones. For the first two days they never quit them; they never stir abroad but when forced by hunger, and then return as soon as they have satisfied their appetite, which they do amazingly quick. Thus they tend and suckle their young for more than six weeks, during which time the buck has no knowledge of them, for he never enters the burrow dug by the doe; and she frequently, when she leaves her little ones, stops up the entrance to it with earth saturated with her own urine. But when they begin to come to the mouth of the hole, and to eat groundsel, and other herbs, which the mother picks out, he then begins to know them; he takes them between his paws, endeavours to smooth their hair,

hair, and licks their eyes. Each, in succession, partakes equally of his cares; at which time the mother bestows many caresses upon him, and generally proves with young a few days after.

From a gentleman in my neighbourhood, who had amused himself many years in rearing rabbits, I received the following remarks; "I began," says he, "with only one male and one female; the former perfectly white, and the latter brown. Of their produce, which was very numerous, the greatest part was brown, many of them white and mixed, and some few black. When the female is in season the male scarcely ever leaves her; his temperament is so warm that I have seen him go with her five or six times within the hour. At this time the female lies on her belly, with her fore legs stretched out, and utters little cries, which seem rather to be tokens of pleasure than pain. Their manner of coupling is similar to that of the cat, only the male scarcely bites the neck of the female. These animals pay great respect to parental authority, at least I judge so from the great deference which all my rabbits shewed for their first ancestor, whom I could easily distinguish by his whiteness, being the only male that I preserved of that colour. The
family



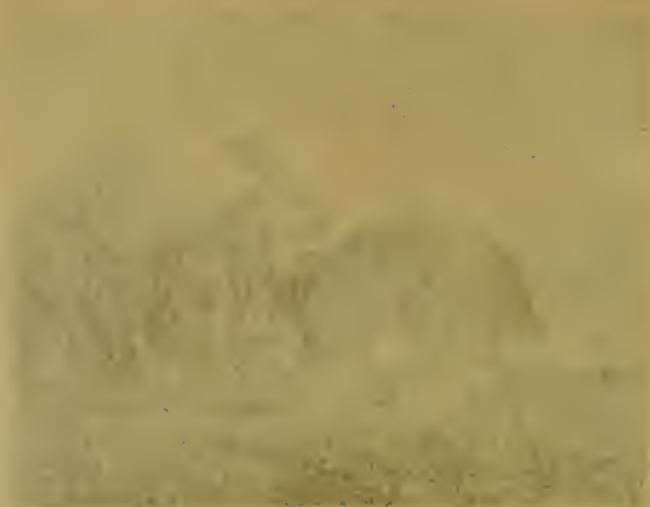
FIG.60..

Hares Male and Female



FIG.61.

Rabbits Domestic and Wild



family very soon augmented, but even those which had become fathers were still subordinate to him. Whenever they fought, whether for females or food, their great progenitor would run to the place of dispute, and as soon as he was perceived order would be immediately restored. If he surprised them in the act of assaulting each other, he would first separate and then chastise them on the spot. Another proof I had of his dominion over his posterity was, that having accustomed them to retire into their place upon the blowing of a whistle, whenever I gave the signal, how distant soever they might be, this old one put himself at their head, and though he came first he made them all pass before, nor would he enter till last himself. I fed them with wheat, bran, hay, and a good deal of the juniper-tree; of this last they ate all the berries, the leaves and the bark, and left nothing but the hard wood. This food gave their flesh an agreeable flavour, and rendered it as good as that of the wild rabbits."

These animals live eight or nine years; and as they pass the greater part of their lives in burrows, where they remain in repose and tranquillity, they grow much fatter than hares. Their flesh is also very different, both in colour
and

and taste. That of the young rabbit is very delicate, but the flesh of the old ones is always hard and dry. They were originally, as I have already observed, natives of hot climates. They were known to the Greeks; and it appears that the only countries in Europe where they anciently existed were Greece and Spain. From thence they were brought into the more temperate climates of Italy, France, England, and Germany, where now they are naturalized; but in colder climates, as Sweden, and other northern parts, they can scarcely be reared in the house, and perish if they are left in the fields. On the contrary, they thrive in excessive heat, for we meet with them in the southern parts of Asia and Africa, as about the Persian Gulph, the Bay of Saldana, in Lybia, Senegal, and Guinea. We also meet with them in our American Islands, whither they have been transported from Europe, and have thriven extremely well.

CHAPTER IV.

OF CARNIVOROUS ANIMALS.*

HITHERTO we have only treated of useful animals. Those which seem injurious are a far greater number; and though it universally appears that what is hurtful exists in greater plenty than what is serviceable, yet, as in the physical world, evil is subservient to good, for there can in fact, be no evil, since nothing, in effect, injures Nature: If to destroy animated beings is hurtful, is not man who is considered as forming a part of the general system of those beings, the most injurious and pernicious of them? He alone sacrifices and annihilates more living individuals than all the carnivorous tribes. No further, then, are they injurious than because they are the rivals of man, because they have the same appetites, the same fondness for animal food; and because to satisfy a want of the most urgent necessity, they occasionally dispute with him that

* This division is according to the last Paris edition of Buffon. We apprise the reader of this, because he will find included under the denomination of carnivorous animals, some, which he may probably have been accustomed to refer to a different species.

that prey which he had reserved for his own excesses; for we sacrifice more to our intemperance than to our real wants. Born to destroy those beings which are subordinate, we should exhaust Nature if she were not exhaustless, and by a fertility superior to our depredations, renovates the destruction we continually make. But it is so ordained that death should contribute to life, and that reproduction should spring from destruction. However great, therefore, may be the waste made by man and carnivorous animals, the total quantity of living matter is never diminished, and if they hasten deaths they are also the cause of new births being produced.

Large animals form but the smallest part of animated nature. The earth swarms with the smaller kinds. Each plant, each grain, each particle of organic matter, contains millions of living atoms. Vegetables appear to be the first fund for subsisting Nature; but this fund, however abundant and inexhaustible, would hardly be sufficient for the still more abundant tribes of insects. Their increase, altogether as numerous, and often more quick, than the reproduction of plants, is a sufficient indication of their superior numbers. Plants are only reproduced once a year, whereas in insects, especially

especially among the smaller species, one season gives birth to several generations. They would multiply, then, more than plants, if they were not devoured by other animals. Among insects there are numbers who live upon other insects ; there are some, as the spiders, which devour with indifference their own as well as other species ; they serve for food to the birds ; and fowls, both wild and tame, are destined for the nourishment of man, or the prey of carnivorous animals. Thus violent deaths seem to be equally as necessary as natural ones ; they are both modes of destruction and renovation ; the one serves to preserve nature in a perpetual spring, and the other maintains the order of her productions, and limits the number of each species. They are both effects dependent upon general causes ; every individual falls of itself at the end of a certain period, or if prematurely destroyed it is from being superabundant. How many are there whose existence is, as it were, anticipated ? How many flowers are cut down in the spring ? How many seeds are annihilated before their developement ? Man and carnivorous animals feed upon individuals which are either wholly formed, or nearly so ; flesh, eggs, grain, and seeds of every species, form their usual nourishment,

ishment, by which alone the exuberance of Nature might be restrained. Let us consider any of the inferior species which serve as food to others; herrings, for example, present themselves in millions to our fishermen, and after having fed all the monsters of the northern seas, they contribute to the subsistence of all the nations in Europe for a certain part of the year. If prodigious numbers of them were not destroyed, what would be the effects of their prodigious multiplication? By them alone would the whole surface of the sea be covered. But their numbers would soon prove a nuisance; they would corrupt and destroy each other. For want of sufficient nourishment their fecundity would diminish; by contagion and famine they would be equally destroyed; the number of their own species would not be increased, but the number of those that feed upon them would be diminished. As this remark is alike applicable to any other species, so it is necessary they should prey upon each other; the killing of animals, therefore, is both a lawful and innocent custom, since it is founded in nature, and it is upon that seemingly hard condition they are brought into existence.

The motives, however, which incline us to doubt of this truth do honour to humanity.

Animals,

Animals, those at least which have senses, and are composed of flesh and blood, are, like us, capable of pleasure, and subject to pain ; it is, therefore, a cruel insensibility to sacrifice, without necessity, those who approach or live with us, and whose feelings are reflected by the signs of pain ; for by those, whose nature is very different to ours, we can be but little affected. Natural pity is grounded on the relations we have with the object that suffers, and it is more or less lively as the resemblance and conformity of the structure is more or less great. The word *compassion* indicates that we suffer, that we are acted upon. The mind partakes less of this pity than the body ; and animals are susceptible of it as well as man ; the voice of pain moves them, they run to the assistance of each other, and they shrink from the dead carcase of one of their own species. Thus horror and pity are less passions of the mind than natural affections, which depend on the sensibility of the body, and on the similitude of its conformation ; therefore this sentiment must diminish in proportion as the nature of one animal differs from that of another. When we strike a dog, or kill a lamb, it excites some pity ; but none do we feel in cutting down a tree, or swallowing an oyster. In fact, can it
be

be doubted that those animals, whose organization is similar to ours, must experience similar sensations? And those sensations must be proportioned to the activity and perfection of their senses; those whose senses are obtuse can they have exquisite feelings? and those who are defective in any organ of sense, must they not also be defective in all the sensations which have any affinity thereto? Motion is a necessary effect of the exercise of sentiment. We have already evinced, (in treating of the nature of animals) that in whatever manner a being is organized, if it has sentiment, it cannot fail to express its feelings by outward motions. Thus plants, though rightly organized, are insensible beings, as well as all animals which have no apparent motion; those animals also which, like the sensitive plant, move only their bodies and are denied progressive motion, have a very small degree of sentiment; and, in fine, those which are capable of progressive motion, but whose actions are, like so many automats, very few and always the same, have but a small portion of sentiment, and that limited to a few objects. There are numerous automats in the human species: education and the respective communication of ideas augment the quantity as well as the vivacity of our sentiments. In
this

this respect how great is the difference between the civilized man and the savage? In the like manner it is with animals ; those that live in a domestic state, by their intercourse with man have their feelings improved ; while those who remain wild possess only the sensibility they inherit from Nature, which is often more certain, but always less in quantity than that which is acquired.

Besides, if we consider sentiment as a natural faculty, independent of the movements which it necessarily produces, we may still be able to estimate and determine its different degrees by physical relations, to which sufficient attention does not seem to have been hitherto paid. Before the highest degree of sentiment can exist in an animated body it is necessary that this body should form a whole, not only sensible in all its parts, but so composed that all these parts should have an intimate correspondence with each other, insomuch that one cannot be agitated without communicating a portion of that agitation to all the rest. It is also necessary there should be one common centre in which the agitations may terminate, and on which the reaction of every movement may be performed. Thus man, and those animals which resemble him most in organization, will be the most sensible

sible beings. Those, on the contrary, who do not form so complete a whole, whose parts have a less intimate correspondence, who have several centres of feeling, and under one cover seem less to comprise a perfect animal, than to contain several centres of existence separate from each other, will be beings far less sensible. The pieces of a polypus, which has been cut, live separately ; the head of a wasp, which is divided from the body, lives, moves, and even eats as before ; a lizard, when cut in two, is neither deprived of motion nor feeling ; the amputated limbs of a lobster are renewed ; the heart of a turtle vibrates for a long time after it is taken out of the body ; all those insects, in which the principal viscera, as the heart and lungs, do not unite in the centre, extend throughout the body, and form, as it were, a series of hearts, and other viscera ; all fishes, whose organs of circulation have but little action ; in short, all animals, whose organization is more or less remote from ours, have more or less sentiment.

In man, and in the animals which resemble him, the diaphragm appears to be the centre of sentiment ; it is on this nervous part that the impressions of pain and pleasure are directed ; it is on this that all the movements of the sensitive

sensitive system are exercised. The diaphragm, in a transverse form, divides the body into two equal parts, of which the superior contains the heart and lungs, and the inferior the stomach and the intestines. This membrane is possessed of the utmost sensibility; it is also so necessary for the propagation and communication of feeling, that the slightest injury of it is always accompanied with convulsions, and often with death. The brain, which is considered as the seat of sensation, is not, therefore, the centre of sentiment, since it may be wounded, and even parts of it removed without causing the death of the animal. Let us then distinguish sensation from sentiment. Sensation is nothing more than an agitation or impression on the sense, whereas sentiment is this very sensation rendered agreeable or disagreeable by the propagation of the agitation through the sensitive system, for the essence of sentiment, its sole characteristic is pleasure or pain, and all other movements, notwithstanding they pass within us, are totally indifferent, nor do they affect us. It is on sentiment that the whole exterior movements, and the exercise of animal force depend; it acts only in proportion as it feels, and the very part which we consider as the centre of sentiment is also the centre of force.

A slight

A slight examination will shew us that all lively emotions, whether of pain or pleasure; in a word, all sensations, whether agreeable or disagreeable, are felt internally in the region of the diaphragm. On the contrary, there is no token of sentiment in the brain; in the head there are none but pure sensations; we only recollect that this or that sensation has been agreeable or disagreeable; and if this operation in the head is followed by a lively and real sentiment, then we feel the impression of it within the region of the diaphragm. Thus the foetus, where this membrane is without exercise, is without sentiment, and the little motions of the foetus may therefore rather be considered as mechanical, than dependent either on sensation or on the will.

Whatever may be the substance which serves as the vehicle of sentiment, and produces muscular motion, it is certainly propagated by the nerves, and is communicated in an indivisible instant from one extremity to the other. In whatever manner this motion may be effected, (whether by vibrations, as in elastic fibres, or by a subtile fire, similar to that of electricity, which not only resides in animated, and in all other bodies, but is constantly regenerated in
the

the former by the motion of the heart and lungs, by the action of the blood in the arteries, and also by that of exterior causes on the organs of sense) certain it is that the nerves and membranes are the only sensible part of the animal body. The blood, the lymph, the fat, the bones, the flesh, and all other solids and fluids, are of themselves insensible; the brain is a soft and unelastic substance, and on that account incapable of producing or propagating the vibrations of sentiment.

What may have given rise to the opinion that the brain was the seat of sensation, and the centre of sensibility, is the circumstance that the nerves, which are the organs of sensation, terminate in the brain; for which reason it was considered as the only part that could receive every agitation or impression. This supposition appeared so simple, and so natural, that no attention was paid to the physical impossibility that attends it, though abundantly evident; for how is it possible that a soft and insensible substance should not only receive impressions, but retain them for a length of time, and propagate all their agitations over the solid and sensible parts? Perhaps it will be answered after Descartes and Peyronie, that it is not in the brain, but in the pineal gland that this principle of sensation resides; but it is

very easily distinguished that the pineal gland, the callous substance in which they would enclose the seat of the sensations, have no connection with the nerves, but are surrounded with the insensible substance of the brain, and so separated from the nerves that they cannot receive the motions of them, and therefore these suppositions, like the former, must fall to the ground. But what, in this case, is the use and functions of this very noble and principal part of the body? Is not the brain to be found in every animal? Do we not find it larger in man, quadrupeds, and birds, which have all much sentiment, than in fishes, insects, and other animals which have but little? When compressed, is not all motion suspended? Does not every action cease? If this part is not the principal of motion, why is it so essentially necessary to it? Why is it proportioned, in every species of animals, to the quantity of sentiment with which they are endowed?

However difficult these questions may appear, I think it is easy to answer them satisfactorily. By an attentive and deliberate examination, the brain, as well as the spinal marrow (which is nothing more than a prolongation of it) is a kind of mucilage, hardly organized. We distinguish in it only the
extremities

extremities of the little arteries, which terminate there in great numbers, and carry no blood but a white and nutritive lymph; these small arteries, or lymphatic vessels, when disunited from the brain by maceration, appear in the form of very slender fibres. The nerves, on the contrary, never penetrate the substance of the brain, but only reach the surface of it, but previously to which they lose their solidity and elasticity, and their extremities next the brain are soft, and almost mucilaginous. Whence it appears that the brain, which is nourished by the lymphatic arteries, furnishes in its turn nourishment to the nerves, which we ought to consider as a kind of vegetable substance, that shoots forth from the brain, and is divided into an infinity of branches. The brain is to the nerves what the soil is to plants; the extremities of the nerves are the roots, which, as in every vegetable, are more soft, and tender than the trunk or branches; they contain a ductile matter proper for the growth and nourishment of the tree; and this ductile matter they derive from the substance of the brain, to which the arteries continually direct the lymph necessary for its supply. The brain, therefore, instead of being the seat of sensation, the principle of sentiment, is only an organ of secretion and nutrition, but it is an organ

or³³ n which is highly essential, and without which the nerves could neither grow nor be preserved.

The brain is also larger in man, quadrupeds, and birds, because in them the quantity of nerves is greater than in fishes and insects, which on this very account have very little sentiment; they have but a small brain, in proportion to the small number of nerves which it nourishes. And here I cannot help remarking, that man has not, as has been said, a proportionably larger brain than any other animal. There are species of apes, and of cetaceous animals, which, proportioned to the size of their bodies, have more brains than man; another fact which proves that the brain is neither the seat of sensation, nor the principle of sentiment, since were it so those animals would have more sensations, and more sentiment, than man. By observing the nutrition of plants we shall perceive that they do not absorb the gross parts of earth or water, and that these must first be reduced by heat into tenuous vapours. In like manner the nerves are nourished by the subtle moisture of the brain, which is received by their extremities or roots, and thence carried into all the branches of the sensitive system. This system, as we have already remarked, forms an individual

individual whole, of which the parts have so close a connection that we cannot wound one without injuring all the rest. The slightest irritation of the smallest nerve is sufficient to throw the whole body into a convulsion, nor is it possible to cure the pain, or remove the convulsion, but by cutting away the nerve above the injured part, and then all the parts to which this nerve joined become at once motionless and insensible. The brain ought not to be considered as an organic part of the nervous system, because it differs both in properties and substance, and is neither solid, elastic, nor sensible. I own that, when compressed, a stop is put to sensation; but this proves it a body foreign to the system, which, from acting with a weight on the nerves, benumbs them in the same manner, as a heavy weight applied to the arm or leg, deadens the feeling; and this is evident, because the moment the compression is removed sentiment revives, and the motion is re-established. I own likewise that, by injuring the brain, convulsions, and even death, will ensue, but these effects are produced from the nerves being injured in their very source. To these reasons I might add particular facts, which would also prove that the brain is neither the centre of sentiment nor the seat of sensation. There have
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been animals, and even children, born without either head or brain, yet endowed with sentiment, motion, and life. In insects and worms the brain is not perceptible, having only a part which corresponds with the spinal marrow, and therefore the spinal marrow might more reasonably be supposed the seat of sensation, being common to all animals, which the brain is not.

The greatest obstacle to the advancement of human knowledge, lies not so much in the things themselves, as in our manner of considering them. However complicated the body of man may be, his ideas are more so. It is less difficult to understand Nature as she is, than comprehend her as she is represented. She has only a veil, but we give her a mask, and conceal her with prejudices ; and we suppose she acts and operates as we act and think ; but her actions however are clear, and our thoughts are obscure ; her designs and operations are always uniform and certain, which we seem to confound with the variable illusions of our own imaginations. I speak not merely of arbitrary systems and imaginary hypotheses, but of the methods by which we generally study Nature. Even experiment, although the most certain method, has been productive of more
error

error than truth ; as the smallest deviation leads to barren wilds, or exhibits a glimpse of obscure objects ; to which affinities and properties are ascribed, and those steps being followed by the whole world, the consequences derived from them are admitted as fixed principles. Of this I might give a proof by exposing what are called principles in all the sciences, both abstract and real. In the former the general basis of principle is abstraction, or one or more suppositions ; in the latter, principles are nothing more than consequences, whether true or false, of the methods which we have adopted. Let us take anatomy for an example : must not the first man who surmounted natural repugnance, and ventured to open a human body, suppose that by dissecting and examining all its parts, he should obtain a knowledge of its structure, mechanism and functions ? but finding the subject more complicated than he had imagined, he was obliged to renounce those pretensions, and to adopt a method, not by which he might know and judge, but by which he might view the parts in a certain order. This method, however, was not to be acquired by one man ; it was to occupy the attention of ages, and even of our ablest anatomists to the present day, and even when acquired it is not science, but the
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road which leads to it; and which might have done so, if instead of keeping within the narrow and beaten track, anatomists had extended the path, by comparing the human body with that of other animals; for does not the foundation of all science consist in a comparison of similar and different objects, of their analogous and opposite properties, and of all their relative qualities? And hence it is, that although human bodies have been dissected for three thousand years, anatomy still remains nothing more than a nomenclature, and hardly any advances have been made towards the real object, the knowledge of the animal economy; in which Nature certainly appears very mysterious, not only because the subject is complicated, but because, having neglected those modes of comparison, which alone could have afforded us any light, we have been immersed in the obscurity of doubt, or bewildered in the labyrinth of vague hypotheses. We have millions of volumes descriptive of the human body, while the structure of animals has been almost entirely neglected. The most minute parts of man have been named and described, and yet we know not whether those parts are to be found in other animals. Certain functions have been ascribed to certain organs, without knowing

ing whether those functions cannot be exercised by other beings though deprived of those organs ; insomuch that in all the explications relative to the animal economy, we labour under the double disadvantage of first engaging in a complicated subject, and then reasoning on it without the assistance of analogy. Through the whole course of this work we have followed a different method ; constantly comparing Nature with herself, we have considered her relatively and in her most distant extremes ; and it will be easily perceived that, after all our labour to remove false ideas, destroy prejudices, and to separate realities from arbitrary opinions, the only art we have employed is comparison. If we have been enabled to throw any light upon these subjects, less is to be attributed to genius than method, and which we have endeavoured to render as general as our knowledge would permit.

Having hitherto avoided giving general ideas, until we had presented the results of particular operations, we shall now content ourselves with collecting certain facts, which will suffice to prove that man, in a state of nature, was not calculated to live upon herbage, grain, or fruits ; but that at all times with the greatest part of other animals, he sought to feed on
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flesh. The Pythagorean diet so highly extolled by some ancient and modern philosophers, and even recommended by certain physicians, was assuredly not prescribed by Nature. In the golden age, man, as innocent as the dove, sought for no nourishment but acorns of the forest, and pure water of the stream. Surrounded with subsistence, he was free from inquietude, lived independently, and at peace with himself and other animals; but losing sight of his dignity, he sacrificed his liberty to the union of society, and exchanged a life of repose for tumultuous warfare. Of his nature thus depraved, the first fruits were cruelty and an appetite for flesh and blood; and this depravity the invention of arts and manners served to complete. Thus have philosophers austere, and by sentiment savage, in all ages, reproached the civilized part of mankind. Flattering their own pride at the expence of their species, they have presented a picture which has no value but from the contrast it exhibits. Did this state of ideal innocence, of perfect temperance, of entire abstinence from flesh, of profound peace and tranquillity ever exist? Is it not a fable in which man, like an animal, has been employed to convey moral lessons? Can virtue have subsisted before

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fore society ? Can the loss of our savage nature merit regret ? or can man, in a wild state, be considered as a more worthy being than the civilized citizen ? Yes, for all misery arises from society ; and what signifies the virtue he possessed in a state of nature, if he was more happy than he is now. Are not liberty, health, and strength, preferable to effeminacy, sensuality, and voluptuousness, accompanied with slavery ? The absence of pain is at least equal to the enjoyment of pleasure, and to be completely happy, is to have nothing to desire. If these observations were just, why do they not tell us it is better to vegetate than to live, to have no appetites than to gratify them, to sleep through life in a perfect apathy, than to open our eyes to see and feel ? that, in short, it is better to be so many inanimate masses attached to the earth, than be capable of enjoying those benefits Nature so bountifully bestows ?

But, instead of discussing, let us advert to facts : Is the savage inhabitant of the desert a tranquil animal ? Is he a happy man ? For we cannot suppose with a certain philosopher, (Rousseau) one of the fiercest censors of civilization, that there is a greater distance between a savage and a man in a pure state of nature, than between a savage and ourselves ; that the ages before man acquired the use
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of speech were more than those in which languages were brought to perfection. In reasoning upon facts all suppositions ought to be thrown aside, until every thing presented by Nature is examined. In doing this we shall descend from the most enlightened to a people which are less so; from those to others yet more rude, but still subject to kings and laws; from these to savages, among whom there are as many shades as in the civilized nations; some of them we shall find forming nations subject to chiefs; others, in smaller bodies, governed by certain customs; and others, the most solitary and independent, united in families, and submitting to their fathers. Thus an empire and a monarchy, a family and a father, are the two extremes of society; and these extremes are likewise the limits of Nature; for if they extended further in traversing the different solitudes of the earth, we must have found these human creatures void of speech, the males separated from the females, the children abandoned, &c. In contradiction to this, I however assert, that it is impossible to maintain that man ever existed without forming families, because the children must inevitably have perished had they not been attended for several years. This physical necessity alone is a sufficient demonstration that

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the human species could neither multiply nor exist without society, and that the attachment of parents to their children is natural because it is necessary ; this attachment was also sufficient to habituate them to certain signs and sounds, and to accustom them to the expressions of sentiment and desire ; of this we are convinced by the facts that the most solitary savages have, like other men, the use of signs and speech. Thus we know that the pure state of nature is that of a savage living in a desert but living with his family, knowing his children, and being known by them, using words, and making himself understood. Neither do the savage girl, found in the woods of Champagne, nor the wild man, in the forests of Hanover, prove any thing to the contrary. They had lived in absolute solitude, and therefore could have no idea of society or of words ; but had they met, Nature would have prompted an attachment, which attachment would soon have taught them to make themselves understood ; they would first have learned the language of love, and then that of tenderness for their offspring. Besides, these must have sprung from parents living in society, and left by them at the age of four or five years, when they had sufficient strength to procure subsistence,

sistence, though too feeble to retain the ideas, which might have been communicated to them.

Let us, then, examine this man in a pure state of nature, that is, this savage living as the head of a family; if the family prospers he soon becomes chief of a numerous body, all observing the same customs, and speaking the same language; at the third or fourth generation, they will become a small nation, which, increasing by time, will either be formed into a civilized people, or remain in a savage state, as circumstances may concur. If they reside in a mild climate, and a fertile soil, where they meet with nothing but desarts, or people like themselves, they will remain in their pristine state, and, according to circumstances, become the friends or enemies of their neighbours. But if under a severe climate, and pinched for want of sustenance, or room, they will make irruptions, form colonies, and blend themselves with other nations, of which they will either become the conquerors or slaves. Thus man, in every situation, and in every region, still aims at society; it is, indeed, an uniform effect, of a necessary cause, since without it the propagation, and, of course, the existence of mankind would cease.

Thus

Thus we plainly see society is founded in Nature; and upon examining, in the same manner, the appetites of savages, we shall find that none of them live solely on fruits, herbs, or grain; that they all prefer flesh and fish to other food, and that instead of preferring pure water, they endeavour to make for themselves, or procure from others, a beverage less insipid. The savages of the south drink the juice of the palm-tree; those of the north take large draughts of disgusting whale oil; others make fermented liquors, and they all possess a passionate fondness for strong liquors. Their industry dictated by necessity, and excited by natural appetite, amounts to nothing more than forming a few instruments for hunting and fishing. A bow and arrows, a net, a club, and a canoe, are the sole produce of their arts, and are all for the purpose of procuring food suitable to their palates. And what is suitable to their palate must correspond with Nature; for, as we have already remarked, in the history of the ox, man, having but one stomach, is not formed to live on herbage alone; nor would he be much better supplied from grain, notwithstanding it has been highly improved by art, and contains more nutritive particles than when possessed only of their relative qualities; yet

yet if man received no other food he would with difficulty drag on a feeble and languishing existence.

Behold the enthusiastic recluse, who abstains, from every thing that has had life, who, from religious motives, renounces the gifts of the Creator, shuns society, and shuts himself up in those consecrated walls, at the very idea of which Nature recoils. Confined in these tombs set apart for the living, he draws on for a very few years, a feeble and useless existence, and when the hour of dissolution comes, it may be said to be that in which he ceased to die. If man were reduced to abstain from flesh, at least in these climates, he could neither subsist nor multiply. Perhaps this diet might be possible in southern countries, where the fruits arrive at greater maturity, where the plants are more substantial, and the roots more succulent. The Brahmans, nevertheless, form rather a sect than a people, and their religion, though very ancient, has never extended beyond one climate. This religion, founded upon metaphysics, is a striking example of the fate of human opinions. From the scattered remains we may plainly perceive that the sciences have been cultivated from great antiquity, and carried perhaps to a greater degree of perfection than they are at this day. It was well known in
ancient

ancient times that all animated beings contained living and unperishable particles, which passed from one body to another. This truth, which was adopted by a few philosophers, and afterwards generally received, could only retain its purity during the enlightened ages, and a revolution of darkness succeeding, nothing more of them was remembered but just enough to countenance the opinion, that the living principle of the animal was an unperishable whole, which separated from the body after death. To this visionary whole they gave the name of soul, which was soon supposed to exist in all animals; and they afterwards maintained, that after death, what they thus termed soul, perpetually transmigrated from one body to another. Man was not excepted from the tenets of this doctrine; and blending morals with metaphysics, they asserted that this surviving being retained in its transmigrations all its former sentiments, affections, and desires. Credulity trembled, and they contemplated with horror the idea that on quitting its present agreeable abode the soul would become the inhabitant of a noisome animal. Fear being the forerunner of superstition they began to entertain fresh alarms, and dreaded, lest in killing an animal, they should

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destroy the mistress they had loved, or the parent which had given them being; every beast they began to regard as a relation or neighbour, till at last, from motives of love and duty, they were obliged to abstain from every thing that had life. Such is the origin and progress of the most ancient religion in India.

But to return to our subject. An entire abstinence from flesh can only serve to enfeeble Nature. Man, to enjoy health, ought not only to use this solid nourishment, but even to vary it; to acquire complete vigour he must chuse that which agrees with him best; and, as he cannot continue in an active state without procuring new sensations, so he must indulge himself with a variety of eatables to prevent the disgust that would follow an uniformity of nourishment, being careful, however, to avoid excess, which is still more injurious than abstinence. Animals which have but one stomach, and whose intestines are short, are forced, like man, to feed on flesh, and, therefore, by an examination of the various animals, it will appear, that their difference in food arises from their conformation, and that their nourishment is more or less solid as their stomachs are more or less capacious. But it must not from this be concluded, that
animals,

animals, which feed on herbs are under a physical necessity of feeding on them alone, although carnivorous animals cannot exist without flesh : we only mean it to be understood, that those which have several stomachs can be supported without such solid food ; not but they might make use of it if Nature had furnished them with talons to seize on prey, since we find sheep, calves, goats, and horses, greedily eat milk and eggs, and do not refuse even meat which has been seasoned with salt ; it may, therefore, be said, that a taste for flesh is a predominant appetite in all animals, and that it is more or less vehement, or moderate, according to their particular conformation, since we find it not only in man and quadrupeds, but in fishes insects, and worms ; for the latter of which, indeed, all flesh seems to be ultimately destined.

In all animals nutrition is performed by organic particles, which, separated from the gross mass of food by digestion, mingle with the blood, and assimilate with all parts of the body. But, independently of this principal effect arising from the quality, there is another which depends on the quantity of the food. The stomach and intestines of supple membranes, which occupy a considerable space in
the

the body, and which, to preserve their tense state, and to counterbalance the force of the adjoining parts, require to be always in some filled measure. If for want of nourishment this space happens to be entirely empty, then the membranes, having no longer an inward support, bear down upon and adhere to each other, and these give rise to all the oppressions and weakness of extreme want. Food, therefore, as well as contributing to the nourishment of the body, serves as a kind of ballast to it. Its presence and quantity are equally necessary to preserve an equilibrium; and when a man dies for hunger, it is not more for want of nourishment than from not having a proper poise to the body. Thus animals, especially the most voracious, are so eager to fill up the vacancy within them, that they will swallow even earth and stones. Clay has been found in the stomach of a wolf; I have seen hogs eat it very greedily, and most birds swallow pebbles, &c. Nor is this from taste but necessity, for the most craving want is not to refresh the blood by a new chyle, but to maintain an equilibrium of the forces in the grand parts of the animal machine.

THE WOLF.

THE Wolf is one of those animals whose appetite for animal food is very strong. Nature has furnished him with various means for satisfying this appetite, and yet though she has bestowed on him strength, cunning, agility, and all the necessary requisites for discovering, pursuing, seizing, and devouring his prey, he not unfrequently dies of hunger; for man having become his declared enemy, and put a price upon his head, he is obliged to take refuge in the forests, where the few wild animals he can meet with escape him by the swiftness of their course, and whom he cannot surprise in sufficient quantities to satisfy his rapacity. He is naturally dull and cowardly, but becomes ingenious from want, and courageous from necessity. When pressed with hunger he braves danger; he attacks those animals which are under the protection of man, particularly

ticularly such as he can easily carry away, as lambs, kids, and even small dogs; if he succeeds in these excursions, he often returns to the charge, till being wounded and closely pursued by dogs and men, he conceals himself during the day in his den, and only ventures out at night, when he traverses the country, searches round the cottages, kills such animals as have been left without, scratches up the earth from under the barn-doors, enters with a barbarous ferocity, and destroys every living thing within, before he begins to fix upon, and carry off his prey. Should these sallies not succeed, he returns to the forests and pursues with avidity any animal he can meet, nay, he will even follow the track of large animals in hopes they may be seized and destroyed by some other wolf, and that he may become a partaker of the spoil. When his necessities are very urgent, he will face destruction; he attacks women and children, and will sometimes dart upon men; in a word, he becomes furious by his continual agitations, and ends his life in madness.

The wolf both externally and internally, so nearly resembles the dog, that he seems modelled upon the same plan; and yet if his form is similar, his nature is totally different, and so unlike are they in disposition, that no two animals

mals can have a more perfect antipathy to each other. A young dog shudders at the first sight of a wolf; and even the scent of one, though new and unknown, is so repugnant to his nature, that he will come trembling to his master for protection. A powerful dog, who knows his own strength, testifies his animosity, attacks him with courage, endeavours to put him to flight, and uses every exertion to get rid of an object whose presence is hateful. They never meet without its terminating in flight or death. If the wolf proves strongest he tears and devours his prey; but the dog is more generous and contents himself with victory; he does not even approve the smell of the body of a dead enemy, but leaves him as food for the ravens, or even other wolves; for they eat the carcasses of each other; and if one wolf happens to be much wounded, a number of them will track him by his blood and speedily dispatch him.

The dog, even in his wild state, is not cruel, he is easily tamed, and continues firmly attached to his master. The young wolf may be tamed, but never has any attachment. Nature in him is stronger than education; he resumes, with age, his ferocious disposition, and returns as soon as he can to his savage state. Dogs, even of the dullest kind, seek other animals and are
naturally

naturally disposed to accompany them ; and by instinct alone, without any education, they take to the care of flocks and herds. The wolf, on the contrary, is the enemy of all society : he does not associate even with those of his own species ; when several are seen together it is not to be considered as a peaceful society, but a combination for war ; their fierceness and loud howlings denote they intend an attack on some large animal, as a stag, ox, or formidable dog. The instant their military expedition is over, they separate, and each returns in silence to his solitary retreat. There is not any strong attachment between the males and females ; they seek each other but once a year, and then remain but a few days together. They always couple in winter ; several males will follow one female, and this association is more bloody than the former, for they growl, fight, and tear one another, and the majority will frequently kill him that has been preferred by the female. It is usual for the she wolf to fly her admirers a long time, and at last retire with the one she has chosen when all the rest are asleep. The female does not continue in season above twelve or fifteen days, the oldest are generally so first. The males have no fixed time, but pass from one female to another from the end of December to

to the end of February. The time of going with young is about three months and a half; and young whelps are found from the end of April till the beginning of July. This difference in the time of gestation between the she-wolf, who goes above a hundred days, and the bitch that does not exceed 60, proves that the wolf and dog differ not more in their dispositions than in their temperament, particularly in one of the chief functions of the animal economy; besides the wolf lives longer than the dog, and the she-wolf breeds but once in the year, while the bitch has two or three litters in the same period; for these, together with the reasons we have adduced in the history of the dog, the wolf and the dog cannot be considered as the same animal; but by the nomenclators of Natural History, who have only a superficial knowledge of Nature. The wolf also differs from the dog in several external characteristics. The aspect of the head and form of the bones are not the same, the cavity of the eye is obliquely placed in the wolf, the orbits are inclined, his eyes sparkle in the night, he howls instead of barking, his step is more precipitate, yet more uniform, his body is stronger but less supple, his limbs more firm, his jaws and teeth larger, and his hair much coarser.

When the females are near the time of bringing forth, they seek for an agreeable place in the inmost recesses of the forest ; in the middle of the chosen spot, they level a small space, cutting away the thorns and briars with their teeth ; they can carry thither a quantity of moss, which they form into a bed for their young ; they generally bring forth five or six, sometimes eight or nine, but never less than three. The cubs, like puppies, come into the world with their eyes closed ; the mother suckles them for some weeks, and soon learns them to eat flesh, which she prepares for them by chewing it ; some time after she brings them field mice, leverets, partridges, and birds yet alive ; the young wolves begin by playing with, and end by killing them, when the dam strips them of their feathers, skins them, tears them in pieces, and gives to each of her young a share. They do not leave this den until they are six weeks or two months old ; they then follow the mother, who leads them to drink in the trunk of some old tree, or to a neighbouring pool. If she apprehends any danger, she hastily conducts them back, or conceals them in some convenient place. Though at other times more timorous than the male, yet when her young are attacked she becomes fearless, and defends them with fury. She never forsakes them.

them until they have shed their first teeth, and completed their new; when, having acquired talents for rapine, and learned industry and courage from her example, she leaves them to shift for themselves, being herself about to be engaged in the care of a new progeny.

Both males and females are capable of generating when two years old. It is probable that the female may be more forward than the male; it is, however, certain, that they are not inclined to copulate before the second winter, which necessarily implies 18 or 20 months of age; a she-wolf, which I reared, discovered no symptoms until the third winter, when she was more than two years and a half old. Huntsmen assert that in every litter there are more males than females, which seems to confirm the general remark, that Nature, in all species, produces more of the former than the latter. From them also we learn that some of the males attach themselves to the females, and accompany them until they are about to bring forth, when she steals from him, and carefully hides her young, lest he should devour them immediately after birth; but that when brought forth, he takes the same care of them as the female, carries them provisions, and if the mother happens to be killed, he carefully brings them up. I cannot, however, pretend

tend to vouch for the truth of these facts, which appear to me contrary to their natural dispositions.

These animals require two or three years to complete their growth, and live to the age of 15 or 20; another proof of our position that the growth takes up one seventh part of life. As the wolf grows old he turns grey, and his teeth appear much worn. He sleeps when full or fatigued, but more by day than night, and is always very easily awakened. He drinks frequently, and in times of drought, when there is no water in holes or trunks of trees, he will come to the brooks or rivulets several times in the day. Although very voracious, he will go four or five days without meat, provided he is well supplied with water. He has great strength, particularly in his fore parts, in the muscles of his neck and jaws. He will carry off a sheep in his mouth, without letting it touch the ground, and at the same time outrun the shepherds, so that nothing but dogs can overtake or oblige him to quit his prey. He bites cruelly, and always with greater vehemence in proportion as he is less resisted, for with such as can defend themselves he is cautious and circumspect. He is cowardly, and never fights but from necessity. When wounded by a bullet he will cry out, and yet
when

when surrounded and dispatched by clubs, he never complains like the dog, but defends himself in silence, and dies as hard as he lived. He is more savage, has less sensibility, and more strength than the dog. He travels and roams about for nights and days together, and perhaps of all animals is the most difficult to be hunted down. The dog is gentle and courageous; the wolf though savage is fearful. If entrapped in a snare he is for some time so frightened and overcome, that he may be killed or taken alive, without offering to resist; he will suffer himself to be chained, muzzled, and led along without giving the least signs of anger or resentment. His senses, particularly that of smelling, are very acute, and the odour of a carcass will strike him, though at more than a league distant; he also scents living animals a great way off, and will hunt them a long time by following their track. On leaving the wood he always goes against the wind, and upon coming to the extremity he stops, smells on all sides, and receives the emanations that may come either from living or dead bodies, and which he nicely distinguishes. He prefers living flesh to carrion, but will eat the most infected carcasses. He is fond of human flesh, and perhaps were he sufficiently powerful he would eat no other. Wolves have been known to follow armies, to go in numbers
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into the field after a battle, and devour such bodies as lay upon the surface, or were negligently interred : when once accustomed to human flesh, they will attack men, preferring the shepherd to his flock, devour women, and carry off children.*

It sometimes happens that whole countries are obliged to arm for the purpose of destroying them. Hunting of them is also a favourite diversion among the great, and is certainly a very useful one. Wolves are distinguished by huntsmen into *young*, *old*, and *very old*; they are known by the prints of their feet, which are large in proportion to their age; those of the females are longer and more slender. It is necessary to have a good bloodhound to put up the wolf, and when upon the scent every art must be used to encourage him, as all dogs have a natural antipathy to this animal, and are very cold in the pursuit. When the wolf is put up, greyhounds should be let after him in pairs, the first pair almost immediately supported by a man on horseback; the second when he is at the distance of eight or nine hundred paces, and a third pair when the other dogs

* These are called *loups garoux*, from the French word *garer*, to take care, signifying that they are to be guarded against; *loup garou* signifies also in the French language an unsociable man; a term, the affinity of which to the former is not easily discoverable.

dogs have come up with and begin to bait him; he keeps them off for a considerable time, but the hunters coming up generally dispatch him with their cutlasses; when killed the dogs never shew the smallest appetite to enjoy the fruits of their victory. The wolf is sometimes hunted by harriers, but as he runs straight forward, and will hold his speed for a day together, the chase is very tedious without greyhounds to harrass and turn him at every view. Several arts have been adopted to destroy these noxious animals such as worrying them with large mastiffs, laying snares, digging pits, and spreading poisoned meats, yet their numbers remain nearly the same, especially in woody countries. The Britons are said to have extirpated them from their island, and yet I am assured they are still found in Scotland; as there are but few forests in South Britain, their destruction there was less difficult.

Their colour differs with the climate in which they live, and sometimes in the same country. Beside the common wolves, in France and Germany, there are others with thicker and yellow coloured hair; these, though more savage are less destructive than the others, as they neither approach flocks nor the habitations of men, but live solely by the chase. In the
northern

northern climates some are found quite black, and others entirely white. The common species are very generally diffused, being found in Asia, Africa, and America, as well as in Europe. The wolves of Senegal resemble those of France, except being larger and more fierce; those of Egypt are smaller than those of Greece. In the East, particularly in Persia, the wolf is trained up for a shew, being taught to dance, and exhibit a number of tricks; and, according to Chardin, when well taught, a single wolf will sell for 500 crowns. This fact proves, that by dint of time and restraint, these animals are susceptible of education. Several which I reared were very docile, and even courteous, during the first year, nor ever attempted to seize the poultry, or other animals, when properly fed, but when they arrived at 18 months I found it necessary to chain them, to prevent their doing mischief, or running away. I allowed one that I had to range at large among some fowls, and he never touched any of them till he was about 18 or 19 months old, when, as a specimen of what he could do, he killed the whole in one night, without eating any of them. I had another which broke his chain and ran off, but not till he had killed a dog with whom he had been
very

very familiar, and a particular instance of the ferocity of a she-wolf I have given under the article Dog.

There is nothing valuable in this animal but his skin, which makes a warm durable covering. His flesh is so bad that it is abhorred by all animals, and no species will eat it, his own excepted. His breath exhales a most fetid odour. As to satisfy his voracious appetite he devours, without distinction, putrid flesh, hair, bones, skin half tanned, or even any thing that comes in his way, so he vomits frequently, and empties himself more often than he fills. In a word, he is every way offensive; he has a savage aspect, a frightful howl, an insupportable stench, a perverse disposition and fierce habit; he is hateful while living and useless when dead.

SUPPLEMENT.

WE have it from Pontoppidan, that wolves did not exist in Norway before the year 1718, and that in the last war between Sweden and Norway they followed the provisions of the army.

The Viscomte Querhoënt has informed me that there are two species of wolves at the Cape of Good Hope, the one black and the other grey with black spots; that they are bigger than those of Europe, and have very large teeth, but their cowardice makes them little apprehended, though sometimes, as well as the ounces, they will steal into the city in the night.

THE FOX.

THIS animal is famous for his craft, and he partly merits the reputation he has acquired. What the wolf (*fig. 62.*) executes by superior strength, the fox (*fig. 63.*) accomplishes by cunning. Without attacking the shepherd, his dog, or even his flock, he finds a more certain way to subsist. Patient and prudent he waits the opportunity for depredation, varying his conduct according to circumstances always reserving some arts for unforeseen events. Self-preservation is his grand object, and though as indefatigable, and more nimble



Wolf.



116.00

Fox



nimble than the wolf, he never trusts entirely to the swiftness of his course, but contrives himself an asylum, where he retires in cases of necessity, and in which he dwells and brings up his young.

As among men, those who lead a domestic life are more civilized than perpetual wanderers; so, among animals, the taking possession of a home, supposes a superior degree of instinct. The choice of situation, the art of rendering it a convenient habitation, and concealing the entrance to it, likewise indicate superior skill and industry. Endowed with both these, the fox turns them to his advantage. He fixes his residence at the edge of the wood, yet not far from some cottage or hamlet; he listens to the crowing of a cock, and the cackling of other poultry; he scents them at a distance; he judiciously chooses his time; creeps slyly along; suddenly makes the attack, and rarely returns without his booty. If he can get into the hen-roost, he puts all to death, and retires with part of his prey, which he conceals at some distance; he then returns for more, which he takes away and hides in the same manner, though in a different place; and this practice he continues, till, warned by the approach of day, or the movements of the family, he retires
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to his den. He makes use of similar arts with the fowler ; visits the nets and springes very early in the morning, expertly takes the birds out of the snare, carries them off successively, and conceals them in different places, above all near the edges of the roads where he sometimes leaves them for two or three days, but is never at a loss to recover his hidden treasure when he is in need. The young hare and rabbit he hunts down ; the old ones he seizes in their seats, and never misses those which are wounded ; he discovers the nests of partridges and quails, seizes the old ones while they are sitting, and destroys a prodigious quantity of game ; so that if he is less injurious than the wolf to the peasant, he is more noxious to the gentleman. The chace of the fox requires less preparation, and is more amusing than that of the wolf. Though all dogs have a great reluctance to the latter, they pursue the fox with pleasure, and often in preference to the stag or hare. He is usually hunted with hounds, assisted by terriers. The instant he finds himself pursued he makes to his den, and takes refuge at the bottom, into which the terriers will follow and keep him at bay, while the hunters remove the earth from above. But as his kennel is often under rocks, or among the roots of trees, he cannot then be dug out,
nor

nor is the terrier able to contend with him at the bottom of his hole. In this case he remains secure; but if he can be dug out, the usual way is to carry him in a bag to some distance, and there set him loose before the hounds. His shifts to escape, when all retreats to his kennel are cut off, are various and surprising. He will then proceed in a direct line before the hounds, but making to the most woody grounds, he takes to those paths most entangled with thorns and briars, and seldom fails to extremely harass and fatigue the dogs.

The most effectual method of destroying foxes, is to lay traps for them, baited with flesh, live pigeons, or fowls. I once suspended on a tree, nine feet high, some meat, bread, and bones, at which the foxes had been so eager in leaping, that in the morning the ground round it was beaten as smooth as a barn floor. The fox is extremely voracious; for besides flesh, he eats with equal avidity, eggs, milk, cheese, fruit, and particularly grapes. When he cannot procure a sufficiency of leverets and partridges, he falls upon rats, mice, serpents, toads, and lizards, which he destroys in great numbers, and thereby renders one service to mankind. Insects, shell-fish, and even the hedge-hog, at times, become his prey. He attacks bees and wasps for
the

the sake of their honey; they at first seem to force him to retire, by repeated stings, but this is only to roll upon the earth and crush those which have stuck to his skin; he then returns to the charge, and by perseverance, obliges them to abandon their combs, when he devours both wax and honey.*

The fox greatly resembles the dog in the internal parts. His head, however, is larger in proportion to his body, his ears are shorter, his tail more bushy, and his eyes more oblique. He also differs from the dog by a strong offensive smell, which is peculiar to his species, and also in disposition; for he is not easily tamed, can never be rendered truly domestic, pines and dies of chagrin when long denied his liberty. As we have already stated, he refuses to copulate with the female dog. The foxes bring forth once a year, they generally have four or five, seldom six, and never less than three. When the female is pregnant, she seldom goes out of her kennel, where she prepares a bed for her young. She is in season in winter, and there are young foxes in April. When she finds her retreat is discovered, and that her cubs have been disturbed during her absence, she endeavours to find a
place

* He seizes also hedge-hogs, rolls them about with his feet, and compels them to unfold themselves; he eats likewise fish, lobsters, may-bugs, grass-hoppers, &c.

place of greater security and carries them to it one after the other. They come blind into the world, and like dogs also they grow from eighteen months to two years, and live to the age of thirteen or fourteen.

The senses of the fox are as good as those of the wolf; his smelling is more acute, and the organs of his voice are more supple and more perfect. The wolf only howls, while the fox yelps, barks, and has a mournful cry like that of the peacock. He varies his tones also according as he is affected. He has tones expressive of desire, sorrow, and pain; the latter of which he never uses but when shot or deprived of some member, for he complains of no other wound, and like the wolf, when attacked with cudgels only, he never utters a sound, but defends himself with bravery and courage, though in obstinate silence until the last gasp. He bites dangerously and with such determined fury that it is difficult to make him quit his hold. His yelping is a kind of quick barking, which he generally terminates by raising his voice and resembling the cry of a peacock. In winter, especially during frost, he yelps continually, but in the summer he is almost entirely mute, and at this season he sheds his hair. The skin of young foxes, or those taken in summer, are held in little esteem. The flesh of the fox is

not

not so bad as that of the wolf ; dogs, and even men, eat it in autumn, especially if he has been fattened with grapes ; and in winter good furs are made of his skin. He sleeps so sound that he may be closely approached without being awakened ; he sleeps in a round position like a dog ; but when he only means to rest, he stretches out his hind legs and lies flat upon his belly. In this posture he watches for birds as they perch on the hedges, who no sooner perceive him, than they set up shrill cries to warn their neighbours against their mortal enemy : the jays and magpies in particular will follow him for some hundred paces, constantly repeating their cries as a warning. The fox has a very disagreeable odour, which makes it necessary to keep them in stables at a distance from the house, and this perhaps might be the reason why those I reared were less tame than the wolf, with whom this precaution was unnecessary. At the age of five or six months the young foxes began to chase the ducks and fowls, upon which account I was obliged to chain them, and although I kept these very foxes for more than two years, they never attempted to touch a fowl while they were so confined ; a live hen was frequently fixed near them for a whole night, and although they had previously been kept short of food, they never forget they were chained,
and

and the hen invariably remained unmolested by them.

The fox is so subject to the influence of climate, that the species are almost as numerous as of any domestic animal. The generality of French foxes are red, some few are grey, but all have the tip of their tail white; the latter are sometimes called in Burgundy *coal-foxes*, from having very black feet. In the northern countries there are foxes of all colours; black, blue, dark and light grey, white, white with reddish legs, white with black heads, white with the end of the tails black, red with the throat and belly white, and lastly with a stripe of black along the back and another crossing it at the shoulders; of these the throats are also black and they are larger than the others. The common kind are most generally diffused; they are not only in Europe, but throughout northern and central Asia and in America; but in Africa and the countries near the equator they are very rare. Those who say they have seen them at Calcutta and other southern provinces, must have taken the jackall for the fox. Aristotle falls into a similar error, when he says, the foxes of Egypt were smaller than those of Greece; those little Egyptian foxes being only polecats, whose stench is intoler-

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able. They are evidently the natives of cold climates, both from their not being affected by extreme cold and their living in the countries adjacent to both poles. The hair of the white fox is not much esteemed, because the hairs fall easily off; the silver-grey is better, and the blue and striped are prized on account of their rarity, but the black is the most valuable, and yields to none but the sable. There are foxes in Spitzbergen, Greenland, Lapland, and in Canada; in the latter place there are some of the striped species, the common kind are not so red as those in France, but their hair is longer and more plentiful.

SUPPLEMENT.

SOME travellers assert that the heads and feet of the Greenland foxes resemble those of dogs, and that they bark like them; that they are of various colours, such as white, grey and blue, and that they live upon eggs, birds, flies, bees, and whatever they can procure from the holes of the rocks in the sea. At Kamtschatka there are some of a dark chesnut, others red
with

with black bellies, and others of a dark grey, all of which have thick coats of hair very glossy and beautiful.

In Norway there are white, red, and black foxes, and also some with black lines along the back. Pontoppidan, who delights in the marvellous, relates several wonderful tales of these animals, and adds that they frequently catch lobsters with their tails.

THE BADGER.

THE Badger is an indolent, diffident, solitary animal, who retires to the most secret places, and there digs for himself a subterraneous residence. He not only shuns society but even the light, spending three-fourths of life in his obscure retreat, and never venturing out but in search of food. He burrows the ground with great facility, as his body is elongated, his legs short, and the claws, those especially of his fore feet, are very long and compact; his habitation is often at a considerable distance

distance from the surface, and the passage to it always oblique and winding. The fox, who is less expert at digging, often benefits from the labours of the badger ; unable to force him to quit his retreat, he often drives him from it by stratagem. He stands sentinel, and defiles it with his ordure, which proves an infallible expedient. The badger gone, he takes possession, enlarges, and accommodates it for his own purpose. Though forced to remove, the badger leaves not the country, but digs himself a new habitation at a little distance, from which he never goes out but at night, even then not far, and returns upon the smallest appearance of danger. In this precaution alone consists his safety, for his legs being very short the dogs soon overtake him. Upon being attacked he throws himself backwards, and as his legs, claws, jaws, and teeth are very strong, he is enabled to fight with obstinacy, and it is seldom that he dies unrevenged.

Formerly, when badgers were more common, terriers were trained up to hunt and take them in their burrows ; but this was no easy task, as his mode of defence is to retire, and doing so, to undermine great quantities of earth, either to stop up the passage or bury the dogs under it. The only certain way of taking him

him is to open the hole above, after the dogs have driven him to the extremity. He is generally taken hold of with pincers, and then muzzled to prevent his biting. I have had several brought me taken in this manner, some of which I kept a long time. The young ones are easily tamed; they will play with dogs, and follow the person from whom they receive their food; but the old ones always retain their savage dispositions. They are neither mischievous nor voracious like the fox and the wolf, yet they are carnivorous; they prefer raw meat, but will eat flesh, eggs, cheese, butter, bread, fish, fruit, nuts, grain, roots, &c. They sleep the whole night and three parts of the day, yet they are not subject to a lethargic torpor during the winter, like the dormouse, or mountain rat; this makes them very fat, although they eat moderately, and they can go several days without food.

They keep their holes extremely clean, nor ever defile them with their ordure. The male is seldom found with the female; when the latter is about to bring forth she collects a quantity of herbage, which having bundled up she trails along, between her feet, to the bottom of her hole, where she converts it into a commodious bed for herself and young ones; she
brings

brings forth in the summer, and generally has three or four at a time ; she nourishes them at first with her milk, but very soon inures them to such food as she can provide. For them she seizes young rabbits, field-mice, lizards, grasshoppers, takes birds' eggs from their nests, and uncovers bee-hives, where they are buried, and carries away their honey ; all which she carries to her brood, whom she often brings to the mouth of the hole, in order to feed or suckle them. These animals are naturally chilly ; and those reared in the house will scarcely ever quit the fire side, which they will approach so close as frequently to burn their feet, which are not easily cured. They are very subject to the mange, and will infect those dogs which penetrate their burrows, unless they are carefully washed. The hare of the badger is always filthy ; between the anus and the tail there is an opening about an inch deep, but which has no communication with the interior of the animal, whence an oily ill-scented liquid is constantly emitted, which the animal is fond of sucking. Its flesh has not a very bad taste ; and of its skin are made coarse furs, collars for dogs, trappings for horses, &c.

In this species we know of no varieties ;
and

and our researches have been fruitless to discover such as have been said to exist ; indeed some of the differences are stated to be so trivial that they cannot fairly be considered as distinct from the others ; besides those species in which there are actual varieties are usually very abundant, and generally diffused, whereas that of the badger is one of the least numerous and most limited. We are not certain that they are to be found in America, unless we regard as a variety the animal sent from New York, of which M. Brisson has given a short description, under the name of the White Badger. They exist not in Africa, for the animal from the Cape of Good Hope, which Kolbe describes under the name of the Stinking Badger, belongs to a different species ; and we doubt whether the Fossa of Madagascar, mentioned by Flacourt, be an actual badger, although he says they resemble those in France. Other travellers take no notice of it, and Dr. Shaw even says it is unknown in Barbary. It seems, likewise, not to exist in Asia ; and that the badger was unknown in Greece is plain from Aristotle's not mentioning it, and its having no name in the Grecian language. This animal, therefore, is a native of the temperate climates of Europe, has never
been

been diffused beyond Spain, France, Italy, Germany, England, Poland, and Sweden, and even in those countries it is not very common. There are not only no varieties, but the badger (*fig. 64.*) does not approach any other species. Its characteristics are striking and singular; to it exclusively belong the alternate stripes upon its head, and the kind of bag under its tail; its body is also nearly white above and black below, whereas in all other animals their bellies are always lighter than their backs.

THE OTTER.

THE Otter (*fig. 65.*) is a voracious animal, but more fond of fish than flesh, and is seldom found but at the sides of lakes and rivers. He swims with more facility than the beaver, who has membranes on his hind feet only, and whose toes on the fore feet are separate, whereas the otter has membranes on all his feet; and he can scarcely walk faster than he swims. He never ventures to the sea like the beaver, but swims up and down the rivers to considerable distances. Although he can remain
a long



FIG.64

Badger



FIG.65

Otter

a long time under water he cannot be properly called an amphibious animal; viz. one equally capable of living in air or in water; his conformation is not calculated for his living in the latter element, and he requires to breathe as much as any terrestrial animal. If they happen to be entangled in a net while pursuing a fish they drown, and this evidently for want of time to destroy a sufficient quantity of the meshes to effect their escape. His teeth are like those of the polecat, though larger and stronger in proportion to its size. For want of fish, frogs, water-rats, or other food, he will eat the young branches and bark of aquatic trees; and in the spring he will eat the young grass. He is as little afraid of cold as moisture. It couples in winter and brings forth in March, and commonly three or four at a time. In general young animals are pretty; but the young otters are not so handsome as the old: from the awkwardness of its motions deformity of figure, and a kind of mechanical cry, which it repeats almost without intermission, one should suspect it a stupid animal. He, however, becomes industrious with age, at least sufficiently so to wage a successful war with the fishes, who with respect to instinct and sentiment, are greatly inferior to other animals; and yet I can scarcely believe he has,

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I will not say the talents, but the habitudes of the beaver, such as always going up against the stream, in order to return more easily down the current when loaded with his prey ; that of fitting up his house, and lining it with boards to exclude the water ; that of laying in a quantity of fish against a future scarcity ; and lastly, that of his being rendered so tame and subservient as to fish for his master, and even taking his booty into the very kitchen. All I know is, that the otter does not dig his own habitation, that he fixes his residence in the first hole he finds, under the roots of poplars or willows, in the clefts of rocks, and even among piles of floating wood ; and in those they bring forth their young ; where we also find heads and bones of fishes ; that they frequently change their residence ; that they drive away their young at the end of six weeks or two months ; that those I attempted to tame endeavoured to bite, though then feeding on milk, and unable to chew fish ; that a few days after they became more mild, probably from having become sick and weak ; that so far from being easily habituated to a domestic life, all those that I endeavoured to rear died very young ; that, in fine, the otter is of a savage and cruel disposition ; that when he gets into a fish-pond he does the same as a polecat

polecat in a hen-house, that is kill more than he can eat, and then carry them away in his mouth.

Though the otter is not known to shed his hair, yet his winter coat is browner than in summer, sells for more money, and makes a very good fur. Some people eat their flesh, which has a disagreeable fishy taste; their retreats are always infected with the stench of fish, which they have suffered to rot around them. Dogs have no aversion to chase the otter whom they easily overtake when at a distance from his hole or the water; when seized he defends himself obstinately, bites cruelly, and sometimes with such force as to snap their leg bones, and he never quits his hold as long as he retains his breath. The beaver, however, though not remarkable for strength, drives the otters away, and will not suffer them to dwell near his residence.

Though this species is not very numerous, they are to be met with in Europe from Sweden to Naples, and also in North America. They were well known to the Greeks, and are probably to be found in all temperate climates, especially in those places which abound with water; for he can inhabit neither burning sands, nor dry deserts; and he equally avoids rivers
which

which are sparingly inhabited, or to much frequented. I do not believe that they exist in hot countries ; for the jiya, which is found at Cayenne, and called the Brazilian otter, though approximate, is of a different species. The North-American otter resembles the European in every respect, except that his fur is more black and beautiful than those found in Sweden or Muscovy.

SUPPLEMENT.

IT is asserted by Pontoppidan, that the otters in Norway frequent the salt, as well as the fresh waters; that they live in the holes of rocks, and that they are drawn out by imitating their voices which is a sort of whistle; and he further says, that one that was tamed and fed on milk constantly, went into the water, and brought fish home with him to the house.

M. de la Borde has informed me there are three species of otters in Cayenne, being of different sizes: the largest weighing at least 50 pounds, and the smallest not above 3 or 4. He says they are so numerous in Guinea, as to be
seen

seen in troops, and so fierce that they will encounter the dogs, but that they are easily tamed and become very familiar. M. Aublit, and M. Oliver, both confirm this opinion of M. de la Borde, adding they have seen them considerably larger than he has mentioned ; and I have received one from Guinea, which appears to be the small one he alludes to ; it is no more than seven inches long, measuring from the tip of the nose to the tail, the latter of which is six inches long, its head and body is marked with regular dark spots mingled with a light yellow, its belly white, its tail brown, excepting just at the extremity, which is white also ; its ears appear to be proportionally larger than the common otter, and its legs shorter.

THE MARTEN.

THE generality of naturalists have considered the marten and pine-weazle, as animals of the same species. That they copulate together is a circumstance which, unsupported by any other testimony than Gesner and Ray, who
only

only assert it on the authority of Albertus, appears to me so doubtful, that I am inclined to think that they have no intercourse, but form two distinct and separate species ; for if the pine-weasel were only a wild marten, or the marten only a tame pine-weasel, the former would uniformly preserve the same characteristics, and the latter would vary ; as in the wild cat, which always remain the same, and the domestic one assumes all sorts of colours. The marten, on the contrary, never varies ; its characteristics are as peculiar and permanent as those of the pine-weasel ; this alone is sufficient to prove they are not simple varieties, but different species. Indeed there is not the smallest reason for terming the marten a domestic animal, since he is in no degree more tame than the fox, who, like him, approaches the habitations of men in search of prey, nor has he any more communication with man than any other animal whom we call wild and savage. Equally in disposition and temperament does the marten differ from the pine-weasel ; the latter shuns open countries, confines itself to the bosom of the forest, and is never in great numbers but in cold climates, while the former approaches our habitations, even takes up his residence in old buildings, hay-lofts, and in holes in the wall.

Besides,

Besides, this species is diffused in great numbers over all the temperate countries, and are even found in hot ones, as Madagascar, and the Maldivé Islands, and is never met with in the northern regions.

The marten has a sharp countenance, a lively eye, supple limbs, flexible body, all its movements are quick, and he rather leaps and bounds than walks; with great facility he climbs walls, enters pigeon-houses, and devours eggs, pigeons, fowls, mice, rats, moles, and birds in their nests. I reared and kept one of them a considerable time. He was easily tamed to a certain degree, but appeared incapable of attachment, and retained so much of his wild disposition, that I could not suffer him to go at large. He made war upon the rats, and harassed the poultry whenever they came within his reach. Though fastened by the middle of the body, he often got loose; at first he went to no great distance, would return in a few hours, but without testifying the smallest joy or affection to any one person, and being hungry he would call for food like a cat or dog; his excursions became afterwards more and more long, and at length he finally disappeared. He was then about a year and a half old; seemingly at the age when Nature had assumed her full ascendancy.

ascendancy. Salad and herbs excepted, nothing eatable came amiss to him ; he was very fond of honey, and preferred hemp-seed to every other grain. We remarked that he drank frequently, that he sometimes slept two days without intermission, and at others he would keep awake for two or three days together ; that before going to sleep he would fold himself up in a round posture, and cover his head with his tail ; that while awake he was in a perpetual motion, so violent and troublesome, that even had he not worried the fowls, there would have been a necessity for chaining him to prevent his breaking every thing to pieces. I had several other martens of a more advanced age, which had been taken in traps, but they remained totally wild, bit every person who attempted to touch them, and would eat nothing but raw flesh.

This animal, it is said, brings forth as often as cats ; and as we find young ones from spring to autumn, we may, indeed, presume that she breeds more than once a year ; and though the younger females do not produce more than three or four, those more advanced in age have six or seven at a time. When about to be delivered they take up their residence in some hay-loft, or in the holes of a wall, which they
stuff

stuff with straw or grass, in clefts of rocks, or in the hollow trunk of an old tree. When disturbed in their habitations they remove their young, of which the growth is very quick, for the one I reared had nearly attained his full growth at the expiration of the first year; from hence it may be inferred their lives do not exceed eight or ten. Its smell is not very disagreeable, but like that of counterfeit musk. Both the pine-weasel and marten, like several other animals, have interior vesicles which contain a strong-scented substance, like that which the civet furnishes. The flesh in some degree partakes of this odour, yet that of the pine-weasel is not altogether unpalatable: the flesh of the marten is more disagreeable, and its skin is of far less estimation.

SUPPLEMENT:

THERE is an animal in Guiana very similar to the common marten, its principal difference consists in its being some trifle larger, and in having its hair sprinkled with

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black and white, a shorter tail, and spotted on the head ; there is also a material difference in the toes, those of the latter animal bearing a much greater resemblance to that of a rat or squirrel than to the toes of a marten.

THE PINE-WEASEL.

THE pine-weasel, or as it is also called, the yellow breasted marten, is a native of the northern countries, where the quantity of furs produced by this species alone is really astonishing. In temperate climates they are seldom met with, and in warm ones never. There are some few in Burgundy, and also in the forests of Fontainbleau, but in general they are as rare in France as the other marten is common. There are none of them in England, because in that country they have no extensive woods. They are alike averse to open and inhabited countries; they remain in the recesses of the forests, and do not conceal themselves among rocks, but range through the thicket or
climb

climb the trees. They live by the chace, and destroy a prodigious quantity of birds, whose nest they seek, to devour the eggs; the squirrel and dormouse likewise become their prey, and they are also very fond of honey. They not only differ from the marten by avoiding the habitations of men, but also in their manner of endeavouring to escape in the chace. When the former finds himself pursued, he makes to his favourite hay-loft or hole; but the latter humours the chace for some time, and then will climb up the trunk of some tree, and from thence take a view of his pursuers as they pass along. The track which he leaves in the snow has the appearance of being made by some large animal, because he always leaps and his two feet strike the ground at the same time. Though rather larger than the marten his head is shorter, but his legs are longer, and consequently he runs with more ease. His neck is yellow, whereas that of the marten is white; his hair is also finer, more thick, and less subject to shed. The female does not prepare a bed for her young, and yet she lodges them very commodiously. Squirrels form nests on the tops of trees with as much skill as birds; when the pine-weasel is near her time she climbs to
some

some squirrel's nest, drives away the owner, enlarges it, and there deposits her young; she sometimes takes the nests of owls or buzzards, or holes in old trees, from which she soon dislodges the woodpeckers, and other birds. She brings forth in spring, and never more than two or three; the young ones come into the world with their eyes closed, but they nevertheless soon acquire their full growth. The mother brings them eggs and birds until they are able to go out, and then she takes them abroad to hunt with her. Birds are so well acquainted with their enemies that they send forth the same notice of danger upon seeing this animal as when they perceive a fox; and a proof that it proceeds more from hatred than fear, is their not only giving this alarm, but also following these and all other carnivorous animals, and never doing so at the approach of the stag, roe-buck, hare, &c.

Pine-weasels are as common in the northern parts of America as they are in Europe and Asia. They are found in Canada, at Hudson's Bay, and as far north in Asia as the kingdom of Tonquin and the empire of China. They must not, however, be confounded with the sable, an animal whose fur is much more precious. The sable is black, but the pine-weasel



FIG. 66.

Pole Cat.



weasel is brown and yellow; the brown part of the skin is the most in estimation, and that extends along the back to the very extremity of the tail.

THE POLECAT.

THIS animal, (*fig. 66.*) greatly resembles the marten in temperament, disposition, habits, and form of its body. Like him he approaches our dwellings, mounts to their roofs, and settles himself in hay-lofts, barns, and unfrequented places; from whence he steals by night into farm-yards, aviaries, and pigeon-houses, where, without making so much noise as the marten, he does more mischief; he twists off all their heads, and then carries them away, one by one, to his hole or dwelling. If, as it often happens, he cannot convey them away entire, from the smallness of the entrance, he eats the brains on the spot, and then retires with their heads. He is particularly fond of honey, will attack the hives in winter, and force the bees to abandon them. They are scarcely ever found

found at any great distance from inhabited places. They copulate in spring, when the males will fiercely contend on the roofs and sheds for the female. They then leave her, and go into the fields or woods for the summer, but she remains in her dwelling, and does not take her young ones out till towards the end of the summer ; she produces from three to five, does not suckle them long, but soon accustoms them to suck blood, and the eggs of birds.

In towns they chiefly subsist on prey, and in the fields or woods on what the chase affords them ; when in the latter they fix their residence in the burrows of rabbits, clefts of rocks, or trunks of hollow trees, from whence they issue at night in quest of the nests of partridges, larks, and quails ; they climb trees to get at those of other birds ; are constantly on the watch for rats, field-mice, and moles, and are at continual war with the rabbit, who cannot escape, as they enter their burrows with ease. A single family of polecats is sufficient to destroy a whole warren ; and indeed this would be a simple method of diminishing their number where they are found too numerous.

The polecat is rather less than the marten ; it has a shorter tail, a sharper snout, and its
hair

hair is more black and bushy. It has some white hair on its forehead, and about the nose and mouth. They differ very much in voice, that of the marten being sharp and loud, and that of the polecat deep and hollow, but both of them, as well as the squirrel, have a harsh, angry growl, which they often repeat when irritated; the odour they send forth is also every different, that of the former being rather agreeable. but the latter to the last degree fetid. When heated or enraged it sends forth an intolerable stench to a considerable distance. The dogs will not eat its flesh, and its skin, though good in itself, is of little value, because it can never be entirely divested of its natural odour; which odour proceeds from two little vesicles, situated near the anus, which contain and exclude an unctuous matter highly disagreeable, not only in the polecat but in the ferret, weasel, badger, &c. but which constitutes a perfume in the civet-cat, pine-weasel and several other animals.

The polecat seems to belong to the temperate climates. Few of them are found in the northern regions, and they are more scarce than the marten in the southern. The Stinkard of America is a different animal; nor does the species of polecat appear to extend further than

than from the confines of Italy to Poland ; it is certain they fear the cold, and they resort to houses in the winter, and their footsteps are never seen in the snow either in the woods or fields distant from human dwellings, and we may fairly conclude they are averse from extreme heat as they are never found in the southern regions.

THE FERRET.

SOME authors have doubted whether the Ferret (*fig. 67.*) and polecat did not belong to the same species. Perhaps the resemblance there sometimes is in their colour first gave rise to this doubt. The polecat, however, is a wild animal and a native of temperate climates, whereas the ferret is a native of warm countries, and cannot exist even in France, but in a domestic state. The ferret is preferred to the polecat for driving rabbits from their burrows, because he is more easily tamed. They both have a strong and disagreeable smell, yet as they never intermix, and differ in a number of essential

essential characters, they may with safety be pronounced two distinct species. The ferret has a longer and thinner body, a narrower head, and a sharper snout than the polecat. It has not the same sagacity in providing its subsistence, and unless taken care of and nourished in the house, it cannot even exist, at least in our climates, for those which have been lost in the burrows of rabbits have never multiplied, but most probably perished by the severity of the winter. The ferret also, like other domestic animals, varies in colour, and is as common in hot countries as the polecat is scarce. The female is conspicuously smaller than the male; and when in season, Gesner says, she has even been known to die if her desires were not gratified. They are reared in casks or chests, where it is usual to furnish them with beds of flax. They sleep almost perpetually, but no sooner are they awake than they eagerly seek for food, which consists of bran, bread, milk, &c. The females bring forth twice a year, and go six weeks with their young. Some of them eat their young almost as soon as they are brought forth, are immediately in season again, and then have three litters in the year, each of which consists of from five to nine.

This animal is by nature a mortal enemy to the rabbit. If even a dead one is presented to a young ferret, although he have never seen a rabbit before, he flies at and tears it with fury ; but if it be alive, he seizes it by the nose or throat, and sucks its blood. When let into the burrows of rabbits, it is necessary to muzzle him, that he may not kill them in their holes, but only oblige them to run out that they may be entrapped in the nets ; besides, if he is suffered to go in unmuzzled, there is great danger of his being lost ; for having sucked the blood of the rabbit, he will fall asleep ; and smoking the hole is not always a successful expedient to bring him back, because as the burrows frequently communicate with each other, he is apt to be the more bewildered the more he is surrounded with smoke. The ferret is also made use of by boys in searching for bird's nests in the holes of walls or trees.

Strabo says the ferret was brought from Africa into Spain ; which does not appear void of foundation, as Spain is the native climate of rabbits, and the country where formerly these animals most abounded. It is probable, therefore, that the rabbits having increased so much as to become incommodious, the ferret was introduced to diminish them, instead of encouraging

raging the race of polecats, from which no advantage could have accrued but the death of the rabbit, whereas by the ferret some benefit is also obtained by the hunter. The ferret, though easily tamed and rendered docile, is exceedingly irascible; he has always an ill smell, but more so when heated or irritated. He has lively but inflamed eyes; all his movements are quick, and is besides so strong, that he will easily master a rabbit three or four times as big as himself.

Notwithstanding the authority of interpreters and commentators, there are still doubts whether the ferret be the *ictis* of the Greeks. “The *ictis* (says Aristotle) is a kind of wild weasel, smaller than the little Maltese dog, but resembling the weasel in its hair, form, whiteness in the under parts of its body, and also in its cunning. Though easily tamed, it does mischief among the bee-hives, being extremely fond of honey. It will also attack birds, and like the cat, its genital member is bony.” It appears first a contradiction, in saying the *ictis* is a species of wild weasel, which is easily tamed, for with us the common weasel is not to be tamed at all; secondly, the ferret, though larger than the weasel, cannot be compared with the lap-dog in point of size; thirdly, it is evident that the ferret does not possess the cunning
of

of the weasel, nor is it even capable of artifice ; and lastly, it does no mischief to bee-hives, nor is it fond of honey. I enquired of M. de la Roy, intendant of the royal forests, as to this last fact, and this was his answer : “ *M. de Buffon may be assured that the ferret has no absolute inclination for honey ; but if kept on slender diet, it may be forced to eat it. For four days I fed some with bread soaked in water mixed with honey ; but though they ate pretty large quantities of it the last two days, the weakest of them was become sensibly more thin.* ” This is not the first time M. de la Roy has furnished me with facts for the advantage of this work. Having no ferret in my possession, I made the like experiment on the ermine, by giving him nothing but honey to eat, and milk to drink ; but he died in a few days. It appears, then, that neither the ferret nor ermine are fond of honey, like the ictis of the ancients, which leads me to think that the word ictis is nothing more than a generic name ; or if it denotes any particular species, it is rather that of the marten or polecat ; both of which possess the cunning of the weasel, attack bee-hives and are particularly fond of honey.



68.

FIG.

69.

Pine Weasel.

Weasel.



71.

FIG.

70.

Rosset.

Ermine.

THE WEASEL.

THE Weasel (*fig. 69.*) is as frequent in warm and temperate climates, as it is scarce in cold ones; the ermine (*fig. 70.*) on the contrary, is numerous in the northern, is scarcely to be met with in the temperate, and never in the warm climates. These animals, therefore, form two distinct species. The circumstance who may have given rise to their being confounded, was possibly our common weasel being sometimes white during winter: in this characteristic they are alike; but there are others in which they widely differ. The ermine, red in the summer, and white in winter, has, at all times, the end of the tail black; whereas the end of the weasel's tail is yellow, even of that which turns white in the winter; it is besides much smaller, and its tail is shorter; nor does the weasel shun the habitations of man like the ermine, to reside in woods and deserts. I have kept both species together, but found no reason to suppose that animals which differ in climate,

climate, temperament, and disposition, would intermix. Among the weasels, it is true, there are some larger than others; but this difference never exceeds an inch in the whole length of the body; but the ermine is full two inches longer than the largest weasel. Neither of them are to be tamed, but must always be kept in an iron cage. Neither of them will eat honey, nor ransack the bee-hives, like the marten and polecat: and therefore, the ermine is not the wild weasel, the *ictis* of Aristotle, which he says is easily tamed, and very fond of honey. So far are the weasel and ermine from being easily tamed, that they will not even eat if taken notice of, but are in continual agitations, endeavouring to conceal themselves; and in order to preserve them it is necessary they should be supplied with a parcel of wool or flax, in which they may hide themselves, and which they make a receptacle for whatever is given them, and seldom ever eat but in the night; and rather than eat fresh meat they keep it for two or three days that it may corrupt. They sleep three parts of the day, and even when at liberty they set apart the night for the search of their prey. When a weasel enters a hen-roost he never meddles with the cocks or old hens, but singles out the pullets and young chicks,

chicks, which he kills by a single bite on the head, and then carries away the whole, one after another; he also destroys the eggs, and sucks them with incredible avidity. In winter they generally reside in ganaries, or hay-lofts, where the females often continue in the spring, and bring forth their young among the hay and straw; and during this period she makes war with the rats and mice with more success than the cats, since she follows them into their holes, and so renders it impossible for them to escape; she also attacks and destroys the pigeons in their houses, and sparrows, and other birds, in their nests. In summer they remove to some distance from the houses, alway choosing low grounds, about mills and streams, hiding themselves among the bushes, to catch the birds; they sometimes take up their abodes in old willows, where the females bring forth their young, for which she prepares a bed of grass, straw, and leaves; she litters in the spring, and it generally consists of from three to five. They are brought forth with their eyes closed but they very soon acquire growth and strength sufficient to follow the mother to the chace. They attack adders, water-rats, moles, field mice, &c. and traversing the meadows devour quails and their eggs. They have

have not a regular walk, but bound forward by unequal and precipitate leaps ; when inclined to mount a tree they make a spring, by which they are elevated several feet at once ; and thus they also act when they attempt to seize a bird.

These animals have also a very strong and disagreeable smell, which is much worse in summer than winter, and when pursued or irritated they infect the air to a great distance. They always move with all possible silence, and never exert their voices but when they are hurt, of which the sound is rough, and very expressive of anger. As their own odour is very bad they seem to feel no inconvenience from any foreign stench. A peasant in my neighbourhood took three new-littered weasels out of the carcass of a wolf, which had been suspended by its hind legs from a branch of a tree ; for though the wolf was almost rotten, the female weasel had brought grass and leaves, and made a bed for her young in the thorax of this putrid carcass.

SUPPLEMENT.

THE Comtesse Noyan declares in a letter which she favoured me with, that I have done great injustice to the character of the weasel, in saying that it is not to be tamed, since she had reared one who would lick her hand when she gave it food, and was as fond and familiar as a dog or squirrel. And N. G. de Mornas assures me that he trained one who would follow him about; and he says that they are to be tamed by frequent stroking them on their backs, and beating them when they offer to bite.

THE ERMINE.

THE weasel with a black tail is called the Ermine or Roselet (*fig. 71.*) the ermine when it is white, and the roselet when it is red or yellowish. Though not so numerous as the

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common weasel, yet many of them are found in ancient forests, and sometimes during winter in the neighbourhood of woods. They are easy to be distinguished at all times, as the end of their tails are always black, and the extremities of their ears and feet white.

We have little to add, with respect to this animal, to those observations we made in treating of the weasel. I kept one for more than a twelvemonth, which to the last remained wild and also retained its noisome odour. It is a pretty little animal, and but for the last circumstance, an agreeable one; it has lively eyes, a pleasing countenance, and so rapid in its motions that it is impossible for the eye to follow them. It was always fed with eggs and flesh, but the latter he would not eat until it became putrid. It disliked honey, and having kept it three days without any other food, it died after eating a very little. The skin of this animal is very valuable; it is far more beautiful than that of the white rabbit; but it very soon changes somewhat yellow; though indeed the ermines of these climates have always a yellow shade.

Ermines abound in the north, particularly in Norway, Russia, and Lapland; where, as every where else, they are red in summer, and white in winter. They feed upon a species of rats
and

and other small animals, very numerous in Norway and Lapland, and of which we shall hereafter treat. They are scarce in temperate, and never found in warm climates. The animal of the Cape, which Kolbe calls by that name, and whose flesh he says is wholesome and well-tasted, is not an ermine, but a different species. The weasels of Cayenne, mentioned by M. Barrere, and the grey ermines of Tartary and the North of China, mentioned by some travellers, are also animals different from our weasels and ermines.

SUPPLEMENT.

IT is remarked by Pontoppidan that, in Norway, the ermines live among the fragments of rocks; that he catches mice, is very fond of eggs, and that when the weather is calm, he will swim across the sea to the neighbouring islands for the sake of sea fowls which are there in great numbers. He says it is asserted that when the female brings forth upon an island, she will bring her young to the continent

ment upon a piece of wood, directing it with her snout; that this animal though very small, will kill bears and rein-deer, which it does by surprising them when asleep and fastening to their ears, where he holds so fast that they cannot disengage him; he also springs upon the backs of eagles and heath-cocks, and will suffer them to take him up in the air, from whence by sucking their blood he soon forces them to descend.

THE GRISON.

THIS animal is added by our author in his Supplement, it having been introduced in a Dutch Edition of his work, where he says, it is thus mentioned by M. Allamand. "This little animal, said he, was sent to me from Surinam, and was named in the catalogue grey-weasel, from which I derived Grison. (fig. 72.) The upper part of its body is brown, but the hair having white points, it has the appearance of being a brownish grey; the throat and neck is a bright grey; its nose, and



FIG. 72

Grison



FIG. 73

Squirrel



and the lower part of its body and legs are black, which forms a singular contrast with its head and neck; it is about seven inches long, its head is large in proportion to its body; its ears are nearly a half circle, its eyes are large, it has strong teeth, five toes upon each foot, yellow claws, and a long tail which ends with a point. It more nearly resembles the weasel than any other animal, but yet it certainly belongs to some other species. I cannot find it mentioned by any traveller, and many persons who had resided at Surinam to whom I shewed it, declared it to be a stranger to them; from which it is evident, it must be a scarce animal, even in its own country, and lives in unfrequented places; of course I have not been enabled to obtain any further particulars of it."

THE SQUIRREL.

THE squirrel (*fig. 73.*) is a pretty little animal, is only half wild, and from its gentleness, docility, and even innocence of manners,
is

is almost entitled to an exemption from this class. He is neither carnivorous nor injurious, though he sometimes seizes on birds; his common food consists of fruit, almonds, nuts, beech mast, and acorns; he is handsome, lively, alert, and industrious; his eyes are full of fire, he has a good countenance, nervous body, and supple limbs; the beauty of his form is heightened by a spreading tail, resembling a plume of feathers, which he raises above his head, to form a kind of shade against the sun. The under part of his body is furnished with an apparatus to the full as remarkable, and which indicate strong generative faculties. The squirrel may be said to be less a quadruped than any other four-footed animal. He generally holds himself almost upright, using his fore feet like hands in conveying food to his mouth. Instead of hiding under the earth he is continually in the air, approaching the birds by his lightness and activity, like them he dwells upon the tops of trees, traverses the forests, by leaping from branch to branch, builds himself a nest, picks up grains and seed, drinks the dew, and does not descend to the earth but when the trees are violently agitated by the wind. He is never found in fields nor open countries; he approaches not the habitation

habitations of men, remains not among bushes and underwood, but resides among the lofty trees of the forest. He avoids the water still more than the earth; and it is even asserted, that when he wants to cross a river, or stream, he uses the bark of a tree as a boat, and makes his tail supply the place of a rudder and sails. He does not sleep, like the dormouse, during winter, but is always awake and lively, insomuch, that if only the trunk of the tree is touched, on which he may be reposing, he instantly flies to another, or conceals himself under a branch. He collects a quantity of nuts during the summer, which he deposits in the hollow part of some old tree, and has recourse to them in the winter; which even then he will endeavour to obtain by scratching off the snow as he passes along. His voice is more shrill and loud than that of the marten; he has besides a loud growl of discontent, which he makes when irritated. As his motions are too quick to walk he generally leaps, or bounds forward; and such is the sharpness of his claws, and agility of body, that he instantaneously climbs a beech tree let the bark be ever so smooth.

During the fine nights in summer the squirrels may be heard crying as they chase each other

other among the trees. Seemingly averse from the heat of the sun they remain all day in their holes or nests, from which they come at night to feed, copulate, exercise and divert themselves. Their nests are clean, warm, impenetrable to rain, and generally formed where the large branches fork off into small ones. They begin its formation by carrying small twigs, which they interweave with moss; this they repeatedly press and stamp upon to give it capacity and solidity to hold themselves and their young; they only leave one opening, which is near the top, and that so small as to be hardly sufficient for them to go in and out; over the opening is a kind of roof, in a conic form, which shelters the whole, and occasions the rain to run off on each side. The females usually produce three or four at a litter; they come in season in the spring, and bring forth about the end of May, or beginning of June. They change their hair at the close of winter, and the new hair is more red than that which they throw off; they comb and dress it with their fore feet and teeth, are very cleanly, have no ill smell, and their flesh is tolerably good to eat. The hair of their tail is used to make brushes for painters, but their skin is of no value to the furrier.

Several

Several species approach that of the squirrel, though there are few varieties in the species itself. Some few are of an ash-colour, but the most of them are inclined to red. The *petits-gris* are a different species, and remain always grey. And, without mentioning the flying squirrels, which are very different from the others, the white squirrel of Cambaye, which is very small, that of Madagascar, called *tsitsihi*, which is grey, and, as Flacourt says, is neither handsome nor easily tamed, the white squirrel of Siam, the grey spotted squirrel of Bengal, the streaked squirrel of Canada, the black squirrel, the large grey squirrel of Virginia, the white striped squirrel of New Spain, the white Siberian squirrel, the variegated squirrel, or *mus ponticus*, the little American squirrel, those of Brasil and Barbary, the palmist, &c. which form so many separate and distinct species from those which we have been treating of, we shall find them all nearly the same.

SUPPLEMENT.

THE squirrel is so very numerous in Siberia, that we may rather suppose it to be a native

tive of the northern than temperate regions. M. Gmelin says, they take them there in traps baited with dry fish. M. Aubry, curate of St. Louis, has an entire black squirrel sent him from Martinico, and which had also little or no hair on its ears.

M. de la Borde mentions a species of squirrel at Guinea, which he says is of a red colour, lives in the woods, feeds on grain, and is about the size of a rat; is always seen alone, and is easily tamed. But I very much doubt whether this is a real squirrel, from its being found in so warm a climate. M. Kalm says there are several species in Pennsylvania, that the smallest sort are the most handsome, and that the larger kind are very destructive to the plantations of maize, and that they will come in large bodies and destroy a whole field in a single night, nay, that they are so mischievous, that a price is set upon their heads. Their flesh is esteemed by the inhabitants, but no value is put upon their skins. Their figures, modes, and manners, he describes to be similar to those of Sweden, and states them to be more numerous in Pennsylvania than formerly.



75.

Water Rat.

FIG. 74.

Rat.



77.

Long tailed Field Mouse.

78.

Short tailed D. D.

FIG. 76.

Mouse.

THE RAT.

IF we descend by degrees from great to small, from strong to weak, we find that Nature has uniformly maintained a balance throughout her works ; attentive only to the preservation of each species, she creates a profusion of individuals, and supports by numbers those she has formed of a diminutive size, and left unprovided with arms, courage, or resources ; she has not only enabled these inferior species to resist and maintain their ground by their own numbers, but has added a kind of supplement to each, by multiplying the neighbouring species. The rat (*fig. 74.*), the mouse (*fig. 76.*), the field mouse (*fig. 77.*), the water-rat (*fig. 75.*), the short-tailed field mouse (*fig. 78.*), the dormouse, the shrew mouse, with several others, which I shall not mention here, because they do not belong to our climate, form so many distinct and separate species, but yet so little varied, that should any one chance to fail, its absence would be hardly perceptible. It is this great number of approximate species that first
gave

gave naturalists the idea of genera, an idea which can only be employed when we view objects in the gross, but which vanishes when we apply it to reality, or when we consider Nature minutely.

Men began by appropriating different names to objects which appeared to them distinctly different, and at the same time, they gave general denominations to such as seemed to resemble each other. Among unenlightened nations, and in the infancy of languages, there are hardly any but general names, or vague or ill-formed expressions for objects of the same order, though in themselves highly different. Thus the oak, beech, linden, fir, yew, pine, had at first no name but that of tree; afterwards the oak, beech, and linden, were called oak, when they came to be distinguished from the fir, pine, and yew, which in like manner would be called fir. Particular names could proceed only from a minute examination of each species, and of course those names would be increased in proportion as the works of Nature were more studied and better understood; the more they studied her, the more generic and specific names would be introduced. To represent Nature, therefore, by general denominations, or genera, is to refer us back to the dark and infant state
of

of human knowledge. Ignorance produced genera, but science will ever continue to create proper names; and we shall not be afraid of increasing the number whenever we have occasion to delineate different species.

Under the generic name of rat several species of little animals have been comprised and confounded; but we appropriate this name solely to the common rat, which is of a blackish colour, and lives in our houses; they generally inhabit barns and granaries, from whence, when food is scarce they invade our dwellings. The rat is carnivorous, or if the expression may be allowed, an omnivorous animal; he prefers hard substances to soft ones, he gnaws wool, linen, and furniture of all sorts; eats through wood, makes holes and hiding places in walls, ceilings, and behind wainscots, from whence he issues in search of food, and frequently returns with as much as he can drag along, forming, especially when he has young to provide for, a magazine of the whole. The females bring forth several times in the year, though mostly in the summer, and have five or six at a time. They love warmth, and in winter they generally shelter themselves near chimneys, or among hay and straw. In defiance of cats, poison, and traps, these animals multiply so
much

much as frequently to do considerable damage. In old country-houses, where great quantities of grain are kept, and where neighbouring barns and hay-stacks favour their retreat and their increase, they often become so numerous that the inhabitants are under the necessity of quitting their dwellings, unless they happen to devour each other, and this is no uncommon thing when they are straightened for provisions; for in case of a famine being occasioned by their numbers the strong kill the weak, open their heads, first eat the brains, and then the rest of the body: the next day hostilities are renewed in the same manner, nor do they suspend their havoc until the majority are destroyed; and this is the reason why, in a place that has been for some time infested with rats, they seem to disappear of a sudden, and return not for a long time. It is the same with field-mice, whose prodigious increase is checked solely by their cruelties to each other when provisions become scarce. Aristotle attributes their sudden destruction to the effect of rains, but rats are not exposed to the weather, and field-mice know well how to secure themselves from its effects, for their subterraneous habitations are not even moist.

Rats are as lascivious as voracious; they have a kind of yelp in their amours, and when
they

they fight they cry. They prepare a bed for their young, and almost immediately provide them with food; and when they first quit their hole the mother watches, defends, and will even fight the cats to save them. A large rat is more mischievous, and almost as strong as a young cat; its fore-teeth are long and strong; and as the cat does not bite hard, but is obliged to depend upon her claws, she must not only be vigorous but well experienced in warfare. The weasel, though smaller, is yet a more dangerous enemy, because he can follow the rat into its hiding places: the combat between these two is often sharp and long, from their strength being nearly equal, but their manner of fighting is different. The rat can only wound by snatches, and with his fore-teeth, which are more calculated for gnawing than biting, and have but little strength; whereas the weasel bites fiercely with his whole jaw, and instead of letting go sucks the blood thro' the wound, and therefore the rat always falls a victim to this formidable enemy.

There are many varieties in this species, as in all those which have numerous individuals. Besides the common rat which is nearly black, there are some brown, grey, reddish, and quite white. The white rat, like
alf

all animals perfectly white has red eyes. The whole species, with all its varieties, appear to be natives of temperate climates, and have been diffused in much greater abundance over warm countries than cold ones. Originally they had none in America, but were transported with the first European settlers, and where they increased so fast as to become the pest of the colonies, and where indeed they had no enemies but the large serpents which swallowed them up alive. The European ships have also carried them into the East Indies, all the islands of the Indian Archipelago, and into Africa, where they are now found in great numbers. In the north they have never multiplied beyond Sweden, and those which are called Norway and Lapland rats, are animals of a different species.

SUPPLEMENT.

IT is asserted by Pontoppidan, that rats cannot live further north than Norway, and that those on the banks of the south side of the river Vorman, very soon die if they are taken to the north,

north, which he attributes to the exhalations of the soil. From the Vicomte Querhoënt I understand that rats multiplied so fast on their first introduction to the isle of France, as even to compel the Dutch to leave it: they have been somewhat lessened by the French, but they still remain in great numbers. He adds, that when a rat has resided some time in India he acquires a very strong smell of musk; and this is confirmed by M. la Boullaye-le-Goux in his voyages. The Dutch voyagers also say that there are scented rats in Madura.

THE MOUSE.

THE mouse is much smaller than the rat, more numerous and more generally diffused. Its instinct, temperament, and disposition is the same; and it differs only in its weakness, and the habits resulting from it. Timid by nature, and familiar from necessity, fear and want are the sole springs of its actions. It never leaves its hiding place but to seek for food; nor does it go from house to house, like the rat, unless forced; nor is it near so mis-

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chievous; its manners are milder, and to a certain degree it may be tamed, but it is incapable of attachment; how indeed is it possible to love those who are perpetually laying snares for us! Though weak he has more enemies than the rat, from whom he has no means of escape but his agility and minuteness. The owls, birds of prey, cats, weasels, and even rats, make war upon mice, while man, by snares and other means, destroy them by thousands. But for their immense fecundity they could not subsist; they bring forth at all seasons, several times in the year, generally have five or six at a time, and which in less than 15 days are sufficiently strong to shift for themselves. As they so soon attain perfection, their duration of life must be short, a circumstance which must necessarily heighten our ideas of their prodigious multiplication. Aristotle* tells us that he put a pregnant mouse into a vessel with plenty of corn, and that he soon after found 120 mice all sprung from the same mother.

These little animals are not ugly, but have much vivacity and acuteness in their looks; nor is there any foundation for that horror some people hold towards them, but the little
surprises.

* Vide Aristotle Hist. Animal. Lib. vi. Cap. 37.

surprises and inconveniences they sometimes occasion. All mice are rather white under the belly, some are quite white, others more or less brown or black. The species is generally spread over Europe, Asia, and Africa; but it is said they had no mice formerly in America, and that, though now so very numerous, they were originally brought from the old continent. Certain it is that this little animal, while it fears human society, closely attends it, and this probably from its natural appetite for bread, cheese, bacon, oil, butter, and other kinds of food which man prepares for himself.

THE FIELD-MOUSE.

THIS animal sometimes called the mulot, is less than the rat, but larger than the common mouse. It is not to be found in houses, but lives in woods and fields. It is remarkable for its large and prominent eyes; and it differs also from the rat and mouse in the colour of its hair, which is tolerably white under the belly, and a reddish brown on the back; they are very generally and abundantly diffused, especially in hilly countries. They appear

pear to be a long time in attaining their full growth, as they vary considerably in size. The largest are better than four inches in length, and the smaller, which appears to be aged, are an inch shorter; and as they are found of all the intermediate sizes there can be no room to doubt their being the same species. It was probably from ignorance of this fact that some naturalists have distinguished them into two species, calling the one the Great Field Rat, and the other the Field Mouse. Ray, who first fell into this error, seems to acknowledge himself unacquainted with any more than one species; and though the short description he gives of two species appear to differ, yet we ought not to conclude that both exist, first, because he himself knew but one; secondly, because we know only one, and notwithstanding all my researches, I have been enabled to discover but one kind; thirdly, because Gesner, and other naturalists, speak only of one, under the name of *mus agrestis major*, which they affirm to be common; and because Ray says the other kind, which he calls *mus domesticus medius*, is also very common; it is therefore impossible but that one or other of these authors must have seen both since they declare they are both common;
fourthly,

fourthly, because as in this same species large and small individuals are found, that circumstance might lead them to consider the former as one, and the latter as another; and, lastly, because the descriptions of these two pretended species are in no respect complete; and we ought not to trust such vague characteristics to establish a specific difference.

The ancients, indeed, mention two species, the one under the denomination of *mus agrestis major*, the other under that of *mus agrestis minor*. These two species are very common, and we are as well acquainted with them as the ancients were; the first is our long-tailed field-mouse; and the other, known by the name of the short-tailed field-mouse, but as it materially differs both from the rat and long-tailed field-mouse, I have not followed the generic appellation, but adopted that of the Italian, and call it *campagnol*.

The long-tailed field-mice, as we have already intimated, are fond of dry and elevated grounds. They are to be found in great numbers in woods and in adjoining fields. They conceal themselves in holes under brush-wood, or trunks of trees, which they find already made, or which they dig, in which they amass such quantities of nuts and acorns, that a bushel has
been

been found contained in one of them ; and this provision is not proportioned to the wants of the animal, but to the capacity of the place allotted for its reception. These holes are generally more than a foot under ground, and often divided into two cells, the one for living in with their young, and the other as a granary. I have often witnessed the considerable damage done by these animals in plantations. They will follow the furrow of a plough and take up all the new-sown acorns, which they convey to their holes ; and in a nursery of trees they are more destructive than all the birds and other animals put together. The only method I could ever find to prevent this evil, was to set traps at every tenth pace distance, through the whole extent of the new-sown ground. No other bait is necessary than placing a roasted nut under a flat stone, supported by a piece of stick, to which the nut must be fastened ; this they are very fond of, and will come eagerly to seize ; but no sooner do they touch it than the stone falls and crushes them to death. I have made use of the same expedient against the campagnol, which is also very destructive. When I first adopted this method, I desired care might be taken to bring me all the animals that were caught in the traps, and it was with astonishment I found
more

more than 100 were taken daily, and this in a piece of land consisting of not more than 40 acres. I obtained more than 2000 in this manner, from the 15th of November to the 8th of December; their numbers afterwards decreased gradually, till the hard frosts commenced, when they retire to their holes, and feed upon what they have collected. A number of years have elapsed since I first made this experiment, and which I always repeated when I sowed trees, and never had reason to complain of its inefficacy. It is in autumn they chiefly abound; in spring they are not so numerous, for if their provisions run short during the winter the strong devour the weak; they also eat the short-tailed species, and several sorts of birds, beginning always with the brains and finishing with the rest of the body. I once put a dozen of these field-mice in a cage, and accustomed them to be fed every morning by eight o'clock; but neglecting them one morning for about a quarter of an hour, one of them had been eaten by the rest; next day they devoured another, and in a few days only one remained; the others having been killed and in part devoured; even the one that survived had his legs and tail mutilated.

The rat multiplies very fast, but the increase
of

of the long-tailed field-mouse is more considerable. The latter brings forth more than once a year, and generally nine or ten at a time, while the rat seldom produces more than five or six. A peasant, on my estate, took twenty-two out of one hole, consisting of two dams and twenty young ones.

This animal is very generally diffused over Europe. It is found in Sweden, and is called by Linnæus, *mus cauda longa, corpore nigro flavescente, abdomine albo*. It is very common in France, Italy, and Switzerland. Gesner calls it *mus agrestis major*. It is also in Germany and England, where it is called the field-mouse. Its greatest enemies are the wolf, fox, marten, birds of prey, and its own species.

THE WATER-RAT.

THIS animal is about the size of a common rat, but in habits and disposition more resembles the otter than the rat. Like the otter it frequents fresh water; is found on the borders of rivers, rivulets, and ponds, and seldom feeds on any thing
but

but fish, though he will sometimes eat frogs, water insects, and even the roots of plants. He has not, like the otter, membranes between his toes; an error which originated with Willoughby, and has been copied by Ray and other naturalists. Though every toe is separated, he swims with facility, keeps a long time under water, and carries off his prey to eat upon the grass or in his hole. Sometimes he is surprised in his hole by fishermen who are searching for craw-fish, whose fingers he bites, and then plunges into the water as his only place of refuge. His head is shorter, his nose broader, his hair more erect, and his tail much larger than the common rat. Like the otter he avoids large rivers, or rather those which are too much frequented. The dogs pursue it very furiously. He is never found in houses or barns, nor does he wander so far from the borders of the waters as the otter, which is sometimes found at a league distant upon land. The water-rat does not frequent high grounds nor dry plains but in moist and marshy valleys they are very numerous. The females come in season about the close of winter, and bring forth in April, generally having six or seven in a litter; they may probably bring forth oftener than once a year, but of this we have no certain knowledge.

Their flesh is not absolutely bad, being eaten by the peasants in catholic countries during Lent, as well as that of the otter. This species is found throughout Europe, the very extremities of the north excepted. If Bellon may be believed they inhabit the banks of the Nile, but the figure he gives of it has so little resemblance to our water rat, that there is great reason to suppose them different animals.

THE CAMPAGNOL.

THE Campagnol, or short-tailed field-mouse, is still more common and generally diffused than the long-tailed kind. The latter generally prefers elevated grounds, while the former is found in woods, meadows, and even gardens. It is remarkable for the bigness of its head and shortness of its tail, which is not above an inch long. It digs holes in the earth, where it amasses corn, nuts, and acorns; the former of which it appears to prefer to every kind of food. About the month of July, when
the

the corn begins to ripen they collect together from all quarters, and frequently do great damage by cutting the stalks to come at the ears; they also seem to follow the reapers and pick up all the grain that falls. When the gleanings are exhausted, they resort to the new-sown lands, and not unoften destroy the hopes of the succeeding year. At the end of autumn, and in winter, most of them withdraw into the woods where they feed on beech-mast, nuts and acorns. Some years they appear in such great numbers that they would destroy every thing were they to continue for any length of time, but for want of food they eat each other, and are also destroyed by the long-tailed field-mouse, the fox, wild cat, marten, and weasel. In its internal parts, this animal more resembles the water-rat than any other; but externally it differs from him in many essential characters: First, in size, the campagnol not being more than three inches long, whereas the water-rat is seven; secondly, by the dimensions of its head and body, those of the former being thicker in proportion than those of the latter; thirdly, by the length of the tail, that of the campagnol not exceeding one third, while that of the water rat is nearly two thirds the length of its body; and lastly, by appetite and inclinations, for the

the former neither feeds upon fish nor plunges into the water, but lives upon grain, acorns, and bulbous roots. Their holes resemble those of the long-tailed field mouse, and are often divided into two apartments, though they are less spacious and are not dug so deep. Several of them sometimes live together. When the females are about to bring forth they collect grass to make beds for their young. They produce in spring and summer, and generally from five to eight at a time.

THE GUINEA PIG.

THIS little animal (*fig. 79.*) though a native of Brasil and Guinea, lives and breeds in temperate, and even in cold countries, provided it is properly taken care of and sheltered from the inclemency of the weather. The Guinea-pig is frequently reared in France, and though very prolific, they are far from being numerous, for the attention they require is poorly rewarded by the profits derived



FIG. 70
Guinea - Pig



FIG. 80
Hedge - Hog

FIG. 81
Shrewmole

derived from them. Their skin is of little or no value, and their flesh, though people do eat it, is very indifferent; a circumstance which might in some measure be removed, by rearing them in warrens, where they might have air, space to range in, and an agreeable choice of herbs. Those kept in houses have the same kind of bad taste with the house rabbit, and those kept in gardens during summer their flesh is less disagreeable, but still insipid.

These animals are of so hot a nature that they begin to copulate so early as at five or six weeks old; their growth, however, is not completed before the end of eight or nine months, though their increase is in bulk and fat only after the sixth, by which time all their solid parts are completely developed. The females go with young three weeks, and they have been known to bring forth at the age of two months. The first litters do not consist of more than four or five, the second five or six, and afterwards they will sometimes have eleven or twelve. She does not suckle her young more than twelve or fifteen days, and when the male returns to her, which he never fails to do three weeks after she has littered, she drives them from her, and if they persist in following he often kills them. Thus these animals bring
forth

forth at least every two months; and as their young produce in the same period their multiplication is astonishing. In one year 1000 might be obtained from a single couple; but their consequent increase is checked by the various means of their destruction; they perish from cold and wet; without resistance they suffer themselves to be devoured by the cats; the females, not having had time to form an attachment to their young, see them destroyed without attempting to protect them. They seem to have no distinct sentiment but that of love, and when disputing for a particular female they will shew themselves susceptible of anger, fight bitterly, and are sometimes killed in the conflict before they will yield. They pass their lives in eating, sleeping and love: their sleep is short, but frequent; they eat every hour, night and day, and indulge in their amours as often as they eat; they emit urine every minute, although they scarcely ever drink. They feed on all sorts of herbs, especially parsley, which they prefer to grain or bread; of apples, and other fruits, they are also very fond. Like the rabbit they eat little at a time, but precipitately, and very often. They grunt like a young pig; make a chirping noise when pleased with their females, and have
a sharp

a sharp loud cry when hurt or irritated. They are very delicate, and so chilly that it is difficult to preserve them through the winter, therefore they must be kept in a place which is thoroughly warm, dry, and healthy. When they feel cold they assemble and press close together, and in this situation the frost often surprises them, and they are sometimes found dead. They are naturally mild and tame, seem equally incapable of doing harm or good, and never form any attachments. Mild by temperament, docile by weakness, almost insensible to every thing round them, they have the appearance of being so many living machines, merely possessed of abilities to propagate a species.

THE HEDGEHOG.

THE hedge-hog (*fig. 80.*) possesses the power to defend itself without fighting, and to annoy without attacking. Having little strength and no agility to escape his foes, he has received from Nature a prickly armour, with the power of rolling himself up like a ball, and presenting from every part of his body a poignant weapon of defence. His fears prove
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an additional security, for the smell of his urine, which they make him throw out when attacked, and which he scatters over his whole body, always proves sufficient to disgust his enemy. Thus dogs content themselves with barking at the hedge-hog, and never shew an inclination to seize it. The fox, however, has the address to master it, by contriving to wound its feet, from which the blood runs into its mouth, but from the weasel, marten, polecat, ferret, or birds of prey, it has nothing to dread.

The females, as well as males, are covered with prickles from the head to the tail, and the under parts of their bodies only are covered with hair; wherefore these arms, so useful to them against their enemies, are highly inconvenient in their amours, as they cannot unite, like other quadrupeds, but face to face, either upright or lying. They come in season in spring, and bring forth at the beginning of summer. I have frequently had the mother and her young brought me in the month of June; their litters generally consist of from three to five; they are white at first, and only the marks of their prickles appear. Desirous to rear some of them, I put a dam and her little family into a tub, with plenty of meat, bread, bran, and fruit, but, instead of suckling, she devoured

devoured them one after another. I was surprised that so indolent an animal should discover such marks of impatience at confinement. A hedge-hog which had one day got into the kitchen, took some meat out of a small kettle, and then defiled it with its excrement. I kept males and females in the same apartments, but though they lived they never coupled. I put several of them in my garden, where they did so little damage that it was hardly perceivable they were there; they lived upon the fallen fruits, and dug the earth to a small depth with their snouts; they eat caterpillars, worms, beetles, and some roots; and they are also very fond of flesh, which they devour either raw or roasted.

In the country they are commonly found in the woods, under the trunks of old trees, in the clefts of rocks, and in vineyards. I do not believe they climb trees, as has been asserted, or make use of their prickles to carry off the fruit; they seize with the mouth every thing they eat, and though they are very numerous in our forests, I never heard of one being seen upon a tree, but are always found in hollow places, or under moss. They remain inactive all day, and only go about during the night. They seldom approach human habitations;

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they prefer dry and elevated grounds, yet are sometimes found in meadows. When touched they do not offer to escape or defend themselves, either with their feet or teeth ; but roll themselves up, and are only to be made to extend by plunging them into cold water ; they sleep during the winter, and therefore if, as it is said, they amass provisions in summer, they would be entirely useless. They at no time eat much, and can exist a long time without any food. Like all other animals who sleep in winter, their blood is cold ; their flesh is not good to eat, nor is their skin, though it was formerly employed in the preparation of hemp, converted to any use.

According to some authors there are two species of the hedge-hog, one with a snout like a hog, and the other with a short muzzle like a dog ; but I know of but one, and of which there are even no varieties in our climates. This animal is pretty generally diffused ; they are in every part of Europe, except Lapland, Norway, and the other very cold countries. Flacourt says there are hedge-hogs at Madagascar, where they are called Sora. The hedge-hog of Siam, mentioned by Father Tachard, seems to be another animal. Those of America and Siberia evidently approach
the

the nearest to our common hedge-hogs, and lastly, the hedge-hog of Malacca seems to be more of the porcupine than the hedge-hog.

THE SHREW MOUSE.

THE shrew mouse (*fig. 81.*) seems to form a shade in the order of small animals, and to fill up the interval between the rat and the mole, which though they resemble each other in size, differ greatly in form, and are a totally distinct species. The shrew is smaller than the common mouse, resembles the mole in its snout, which is longer than the jaw-bones; in its eyes which, though larger than those of the mole, are in the same manner concealed, and smaller than those of the mouse; in the number of its toes, having five on each foot, in its tail and legs, particularly the hind ones, which are shorter than those of the mouse; in its ears, and lastly, in its teeth. This extremely little creature has a strong smell peculiar to itself, and so offensive to cats, that though they chase and kill, they will not eat it.

This

This noisome odour, and the aversion of the cats, most probably gave rise to the notion that the shrew mouse is a venomous animal, and that its bite is hurtful, particularly to horses; but the truth is, that it is neither venomous nor able to bite, for its mouth is not capable of sufficient extension to take in the double thickness of another animal's skin, which is absolutely necessary in order to bite. Besides, the distemper among horses, which is vulgarly attributed to the shrew mouse, is a swelling proceeding from an internal cause, and therefore can have no connexion with the bite, or the puncture of this little animal.

The shrew mouse, especially in winter, fixes its residence in stables, hay-lofts, or barns; it feeds on grain, insects, and putrid flesh. It also resides in woods and fields, where it lives on grain; it sometimes conceals itself under moss, leaves, the trunks of trees, and sometimes in holes abandoned by moles, or in holes of a smaller size, which it digs for itself, with its claws and snout. The shrew produces, it is said, as many young at a time as the common mouse, but not so frequently. Its cry is more sharp, but it is not near so nimble, and as it sees imperfectly, and runs slowly, there is very little difficulty in taking it. Their usual colour

colour is brown mixed with red, though some are ash-coloured, and all of them are white under the belly. They are very common throughout Europe, but do not seem to exist in America. The animal of Brasil, which Marcgrave mentions as the shrew mouse, and describes with three black stripes upon the back, is larger, and appears to be of a different species.

THE WATER SHREW MOUSE.

THIS animal, though a native of these climates, was unknown to any of our naturalists, until M. Daubenton first discovered and described it in the *Memoires de l'Academie*, in 1756. To the former animal we have only to add, that this is taken near the source of fountains, as the sun rises and sets; that in the day it remains concealed in the clefts of rocks, or in holes at the edges of rivulets; that it brings forth in spring, and has generally nine young ones at a time.

THE MOLE.

THE mole, (*fig. 82.*) without being blind, has eyes so small, and so concealed, that it can make but little use of seeing, but in recompence Nature has supplied it with an ample portion of the sixth sense. Of all animals the mole is the most profusely furnished with generic organs, and of course with the relative sensations. The senses of hearing and feeling it enjoys in an eminent degree ; a skin as soft as velvet, and its little paws, with five claws, are very different from other quadrupeds, and nearly resemble the hand of a human being ; they have great strength in proportion to the size of their bodies, and so strong and reciprocal an attachment subsists between the male and female, that they seem to have a dread of, and a disgust to, all other society. They enjoy the mild habitudes of solitude and repose ; the art of securing themselves, of instantaneously forming an asylum, of extending it, and of obtaining a plentiful subsistence without a necessity for relinquishing it. Such are
the

the dispositions, manners, and talents, of this animal, and they doubtless are preferable to qualities more brilliant, which are perhaps more incompatible with happiness than even an absolute deprivation of sight.

The mole shuts up the entrance to its retreat, which it seldom leaves, unless forced by heavy rains, or it becomes demolished by man. It prefers cultivated grounds, and is never to be found in those which are muddy, hard, or stony; and delights in a soft soil, well supplied with esculent roots, insects and worms, of which its principal nourishment consists. As they seldom come above ground they have but few enemies, and easily elude the pursuit of carnivorous animals. Their greatest calamity is an inundation, and when that happens, they are seen swimming in great numbers, and using every effort to save themselves by reaching the high grounds; but the greatest part of them perish, as well as their young who remain in the holes. Were it not for such accidents, from their great fecundity, they would be extremely incommodious to farmers. They couple at the beginning of spring, and their young ones are found as early as May. They generally have four or five at a time, and it is easy to distinguish the mole-hill under which they
have

not an inhabitant of hot climates. The moles of America, particularly the red ones, are also different. The Virginian mole, however, is not unlike ours, except in the colour of the hair, which is mixed with a deep purple. In our common moles there are only two or three varieties; some are more or less brown or black, and some few we have seen entirely white. Seba mentions, and gives a figure of a mole with black and white spots*, which he found in East Friesland, and which was rather larger than our moles.

I received from M. Sonnerat the skin of what he calls the Mole of the Cape of Good Hope (*fig. 83.*) which bears a near resemblance to the common moles, excepting the fore-feet and the head, which is much larger, and has a snout somewhat like the Guinea Pig. Its hair is dark brown, with yellow tips, which gives it a bright shade, and its tail is covered with long hairs of a yellowish white. Upon the whole, I am inclined to think that it cannot be considered as a simple variety, but that it is a different species.

* This mole, says he, was found on the highway. It is a little longer than the common mole, from which it differs in no respect but the colour of the skin, which is diversified on the back and the belly with black and white spots, and these intermixed with a few grey hairs as fine as silk. The snout of this animal is long, and covered with hair of a considerable length; and its eyes are so small that it is difficult to distinguish them.—*Albert Seba, vol. I. p. 63.*



82.

FIG.

83

Mole

Cape D^o



84.

FIG. 86.

85.

Long Eared

Common Bat. Pipistrell.

Bats.

THE BAT.

THOUGH all beings are equally perfect in themselves, as coming from the hands of the Creator, yet, in their relation to man, some appear more accomplished, and others more imperfect or deformed. The former are those whose figures are agreeable to us, and which we esteem complete, because all their parts are well connected, their members proportioned, and their functions easy and natural. The latter are those whose qualities are offensive to us, whose nature deviates from other beings, and whose forms differ from those whence we drew our first sensations, and those ideas which serve to model our judgments. The head of a man upon the neck of a horse, its body covered with feathers, and terminated with the tail of a fish, is a picture of enormous deformity, only because it is an assemblage of the most incongruous diversities of nature. An animal, like the bat, which is half quadruped and half bird, and which, in fact, is
neither

neither the one nor the other, is a kind of monster, because it unites the attributes of two such different genera, and resembles none of those models presented to us in the grand classes of Nature. It is an imperfect quadruped, and a still more imperfect bird ; as a quadruped it should have four feet, and as a bird it should have feathers and wings. In the bat the fore feet are, properly, neither feet nor wings; though the animal uses them for the purpose of flying and dragging himself along the ground ; they are two shapeless extremities, of which the bones are of an enormous length, and connected by a membrane neither covered with feathers nor hair like the rest of the body ; they are a kind of small wings or winged paws, in which we only see one claw about an inch in length, and with which the other four, though very long, must act in conjunction, as they have no peculiar movements, no separate functions ; they are a kind of hands ten times larger than the feet, and four times longer than the whole body of the animal ; in a word, they are parts which have rather the appearance of caprice and accident, than a regular production. This membrane covers the arms, forms the wings, or hands, of the animal, is united to the skin of the body, and, at
the

the same time envelopes not only its legs, but even its tail, which by this whimsical junction becomes; as it were, one of its toes. To these incongruities, these disproportions of the body and members, maybe added the still more striking deformities of the head. In some species the nose is hardly visible; the eyes are sunk near the tip of the ear, and confounded with the cheeks; in others the ears are as long as the body, or else the face twisted into the form of a horse-shoe, and the nose covered with a kind of crust. Many of these animals have four substances from their heads, resembling ears, and of all of them the eyes are small, obscure, and covered; their noses are ill-formed, and their mouths extend from ear to ear; they shun society and the light, inhabit dark places, which they quit only for nocturnal excursions, return before the break of day, and in a manner glue themselves against the walls. Their motion in the air is less a flight than an uncertain flutter, which they execute by struggles and in a very awkward manner; they raise themselves from the ground with difficulty, and never soar to a great height; their flight being far from either rapid or direct, but is performed by hasty vibrations in an oblique and winding direction; in their flight they, however, seize gnats, moths,

moths, and other nocturnal insects. These they swallow entire, and in their excrements we meet with the remains of wings and other dry parts which they were unable to digest.

Having one day descended into the grottoes of Arcy to examine the stalactites, I was surprised to find, upon a spot covered with alabaster, and in a place so gloomy, a kind of earth so very different; it consisted of blackish matter several feet in width and breadth, and composed almost entirely of wings and legs of insects, as if immense numbers had collected there and perished together. This heap, however, was nothing more than the dung of bats, amassed, probably, from their having made that their favourite residence for many years; for in the whole extent of the grottoes, which is more than the eighth of a league, I saw no other similar mass; I therefore concluded that they had fixed upon this spot, because a small gloomy light reached it from the top, and that they had not proceeded further, lest they should have been too much enveloped in obscurity.

Bats have nothing in common with birds, except the faculty of flying, and therefore must be classed among quadrupeds; but as the ability to fly implies a great degree of force in the superior and anterior parts of the body, the pectoral

pectoral muscles of the bat are more strong and fleshy than those of any other quadruped, a circumstance in which they have some resemblance to birds; in every other respect their conformation both external and internal is different. The lungs, heart, organs of generation, and all other viscera, except the prominent sexual distinction, which is similar to that of a man or a monkey, are the same as in other quadrupeds; like them also they are viviparous, and have teeth and nipples. It has been affirmed that they bring forth only two at a time, that they suckle their young, and even carry them when they fly. It is in summer they couple and bring forth, for during winter they are in a state of torpor; some cover themselves with their wings as with a cloak, and suspend themselves by their hind legs in subterraneous caverns; others cling to walls, or conceal themselves in holes. When they retire they do it in numbers, and collect together to defend each other from the cold; and they pass the whole winter, from the end of autumn to the spring, without either food or motion. They can support hunger better than cold; and though they can subsist many days without food, they are nevertheless carnivorous; for when opportunity serves, they will devour

devour meat of all kinds, whether raw or roasted, fresh or corrupted.

There were but two species of bats described as natives of our climate, until M. Daubenton discovered five others equally common and abundant, which renders it astonishing they should have remained so long unnoticed. The whole of them are widely different, and never dwell together. The first is the common bat, (*fig. 86.*) which we have already described. The next is the long-eared, (*fig. 84.*) which is perhaps more numerous than the common bat; its body is more diminutive, its wings are shorter, its snout smaller and more pointed, and its ears large beyond all proportion. The third species, which I call the noctule, from the Italian word *noctula*, was not known, though very common in France, and more frequently met with than the two preceding. It is found under the roofs of houses, castles, and churches, and in hollow trees; it is almost as large as the common bat, its ears are broad and short, its hair of a reddish cast, and its voice sharp and piercing. The fourth is distinguished by the name of the *serotine*; it is smaller than the common bat or the noctule, and nearly the size of the long-eared; its ears, however, are sharp, and pointed, its wings are black, and its body of a deep brown.

brown. The fifth I call the pipistrelles, (*fig. 85.*) from the Italian word *pipistrello*, which signifies also a bat. Of all the bats this is the smallest and least ugly, though the upper lip is swelled, its eyes small and hollow, and its forehead covered with hair. The sixth is named the barbastelle (*fig. 89.*) from *barbestello* another Italian word, signifying a bat. This is nearly of the same size as the long-eared; its ears are as broad but not so long. The name *barbastelle* is the more applicable to it, as it seems to have whiskers, which nevertheless are only protuberances over the lips; its snout is short, nose flat, and its eyes close to its ears. The seventh, and last, is distinguished as the horse-shoe bat, (*fig. 88.*). The face of this animal is singularly deformed, of which the most apparent feature is a membrane in the form of an horse-shoe round the nose and upper lip; this species is very common in France, among the walls and in the vaults of old ruinous castles, and of which there are large and small, but in form, and in every other particular, they are similar. As I have not met with any of the intermediate sizes, I cannot determine whether this difference is produced by age, or a permanent variety in the same species.

THE LOIR.

OF the loir, or great dormouse, or as some naturalists have termed it, the fat squirrel, there are three species; and, like the marmot, they all sleep during the winter; namely, the loir, the lerot, and the muscardin, or common dormouse. These three species have been confounded together although they are very different, and easily distinguished. The loir is nearly of the size of the squirrel, and like that animal, has its tail covered with long hair; the lerot is not so large as a rat, has very short hair on its tail, except at the extremity, where there is a tuft of long hair; the dormouse is not bigger than the common mouse, its tail is covered with longer hair than the lerot's, but shorter than the loir's, and it also has a tuft at the extremity. The loir differs from the other two, by having black spots about its eyes, and the dormouse by having white hair upon his back.



87

FIG. 89

88

Scrotine Bat

Barbastelle D^o

Horseshoe D^o



90

FIG.

91

Dormouse

Alpine Marmot

back. They are all white or whitish under the neck and belly ; the white of the lerot is beautiful, that of the loir more dark, and that of the dormouse has a yellow line in all the inferior parts.

There is no truth in the assertion that these animals sleep during winter, for they are not in a state of natural sleep, but in a torpor produced by the coldness of the blood, by which they lose the use of their senses and members. Their internal heat does not exceed the temperature of the air. When the heat of the air is ten degrees above the freezing point, their heat is exactly the same. The ball of a small thermometer I have plunged into the bodies of several living lerots, and always found the heat of their bodies was nearly equal to the temperature of the air ; and sometimes when applied to the very heart, I have observed the thermometer fall from half a degree to a whole one, the temperature of the air being at eleven. Now it is well known that the internal heat of man, and of the generality of quadrupeds, at all times exceeds thirty, and therefore there is little reason to be surprised that these animals, whose heat is so small, should become torpid, when their little internal heat ceases to be assisted by the external heat of the air ; a circumstance

cumstance that naturally happens when the thermometer is not above ten or eleven degrees above the freezing point. This is the real cause of the torpor of these animals, a cause which has been overlooked, although it extends to all animals which sleep during winter. Alike are its effects upon these animals, the hedge-hog and bats; and though I have never had the opportunity of trying them upon the marmot, I am persuaded its blood is not less cold, since like them it is subject to a torpor during winter.

The torpor continues as long as the cause which produces it, and ceases with the cold. A few degrees of heat above ten or eleven is sufficient to reanimate them, and if kept in a warm place during winter they do not become torpid, but go about and eat and sleep, from time to time, like other animals. When they feel the cold they crowd close together, and roll themselves up like balls, in order to present a smaller surface to the air, and to preserve some warmth. It is thus they are found during winter in hollow trees, and in holes of walls exposed to the south: in these they lie without motion, on moss and leaves, and when taken, if tossed or rolled about they never stir, or shew any signs of life; it is by a mild and gradual

gradual heat alone they are to be recovered, for if carried suddenly near a fire they perish. Though in this state they are without motion, though their eyes are shut, and they seem to be deprived of all their senses, yet they feel pain when it is very acute; they testify it when burned or wounded by a contraction, and a little hollow cry, which they will repeat several times; hence it is plain the internal sensibility must subsist, as well as the action of the heart and lungs, yet it is to be presumed that these vital motions act not with the same force and power while in the torpid as in the usual state. The circulation, probably, is not performed then but in the larger vessels; the respiration is slow and feeble, the secretions are very scanty, and perspiration must be nearly annihilated, since they could not pass several months without eating were they to lose as much of their substance in proportion by perspiration as they do when they have an opportunity of repairing it by taking of sustenance; they do lose some part, however, since in very long winters they die in their holes. Perhaps indeed it is not the duration but the severity of the cold that cuts them off, as they soon die if exposed to an intense frost. What induces me to believe that it is not from waste of substance they perish in long winters, is their being very
fat

fat in autumn, and equally so on their reviving in spring; this abundance of fat being an internal substance, sufficient to supply what they lose by perspiration. Besides, as cold is the sole cause of their torpor, and they never fall into that state but when the temperature of the air is beyond the tenth or eleventh degree, they often revive during the winter, for in that season there are frequently hours, and even days, in which the liquor will be found at the twelfth, thirteenth, or fourteenth degree, and during this mild weather the dormice quit their holes in search of food, or rather eat what they had amassed the preceding autumn.

Aristotle asserted, and he has been followed by succeeding naturalists, that dormice pass the whole winter without eating, and that during this period of abstinence they become very fat, being more nourished by sleep alone than other animals by food. This is both untrue and impossible. In its torpid state, which lasts four or five months, it could only fatten by the air it breathes; and allowing (which however is granting too much) that part of this air is converted into nourishment, could so considerable an increase result from it? Would it be sufficient to recompense the waste by perspiration? Aristotle might have been led into this error by the winters in Greece being very mild,

mild, where the dormice do not sleep continually, but taking nourishment every time they were revived by the warmth they might become fat, though in a torpid state. The truth is they are always fat, especially in autumn and summer. Their flesh is not unlike that of the guinea-pig. They were reckoned delicacies by the Romans, who reared great numbers of them. Varro describes the method of making warrens for them, as does Apicius of dressing them in the best manner. Their instructions, however, have been neglected, either from a disgust to a loir from his near resemblance to a rat, or from his flesh being unpalatable. I have been told by peasants who had eaten them, that it is hardly preferable to that of the water-rat.

The loir has a considerable resemblance to the squirrel in its natural habits; it lives in forests, climbs up trees, and leaps from branch to branch, though not so nimbly as the latter, because his legs are not so long, and he is as remarkable for being fat as the other is for being slender. Nuts, and other wild fruits, compose the usual nourishment of both; the loir likewise eats small birds, which he takes in their nests. He does not, like the squirrel, nestle on the upper parts of trees, but makes a
bed

bed of moss in the trunks of those which are hollow; he also shelters himself in the clefts of rocks, and always prefers dry places. He avoids moisture, drinks little, and rarely descends to the ground; but there is a material difference between him and the squirrel, as the latter is easily tamed, but the loir always remains wild. They couple about the end of spring, and the females bring forth in summer, generally producing four or five at a time. Their growth is quick, and it is asserted that they do not live more than six years. In Italy, where they still eat them, the inhabitants dig pits in the woods, which they line and cover with straw and moss; for these pits they chuse a dry spot, sheltered by rocks and exposed to the south; to which the loirs resort in great numbers, and the people find them there in a torpid state, about the end of autumn, when they are fittest to eat. They are full of courage, and will defend their lives to the last extremity; their fore-teeth are both long and strong, and they bite violently; they have no fear of the weasel nor small birds of prey; they baffle the attempts of the fox by mounting to the tops of the trees, nor have they any very formidable enemies but the martens and wild cats.

This

This species is not very much diffused ; it is not met with in the cold climates, such as Lapland and Sweden ; at least the naturalists of the north do not mention it ; the species they describe being the muscardin, the smallest of the three ; neither, I presume are they to be met with in very hot climates, travellers being silent about them. There are few or none of them in open countries like England ; they require a temperate climate, and the country covered with wood. We meet with them in Spain, France, Greece, Italy, Germany, and Switzerland, where they live in forests, upon hills, and not on the tops of mountains, like the marmot, which, though subject to a torpor, from the cold, seems to delight in frost and snow.

THE LEROT.

THE loir lives in forests and seems to shun our habitations, but the lerot, (called sometimes the middle dormouse, at others the garden squirrel) on the contrary, inhabits our
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gardens, and is sometimes to be found in our houses ; this species is likewise more numerous and more generally diffused ; and there are few gardens which are not infested with them. They nestle in the holes of walls, climb up trees, choose the best fruits, and devour them as they begin to ripen. Peaches seem to be their favourite fruit, and whoever wishes to preserve them must take pains to destroy the lerot. They likewise climb up pear, plum, and apricot trees, and in a scarcity of fruits, they eat almonds, nuts, and even leguminous plants. These they carry off in great quantities to their holes, which they dig in the earth, above all, in well cultivated gardens, where they make themselves beds of herbs, moss, and leaves. The cold stupefies them, but they are revived by the heat ; eight or ten of them are sometimes found in one place, in a state of torpor, all huddled together, and rolled up in the midst of their hoard of provisions. They couple in spring and bring forth in summer. They commonly have five or six young at a time ; they are very quick of growth, but do not engender till the second year ; their flesh is not eatable like that of the loir ; they have the same disagreeable smell as the house rat, whereas the loir has no bad smell ; they never become

so fat as the latter. This animal is found in all the temperate climates of Europe, and even in Poland and Prussia, but they do not appear to exist in Sweden and the more northern countries.

THE DORMOUSE.

OF all the species of the rat, the dormouse (*fig. 90.*) is the least ugly. It has brilliant eyes, and a full tail, which is rather white than red. It never lives in houses, and seldom in gardens, but like the loir, chiefly frequents the woods, and shelters itself in the hollows of old trees. This species is by no means so numerous as that of the lerot. The dormice are always found alone in their several holes, and I had much difficulty to procure a few of them; they however, seem to be pretty common in Italy, and not unknown in the northern climates, since they are comprised by Linnæus in his list of Swedish animals; but they do not appear to exist in England, for Mr. Ray in his Synopsis, who had seen it in Italy, says the small dormouse
found

found in England is not red on the back like the Italian muscardin, and that it probably belongs to a different species. In France it is the same as in Italy, and is justly described by Aldrovandus in his History of Quadrupeds; but he adds there are two species in Italy, one of which is scarce, and has the smell of musk, the other more general without any particular odour, and that at Bologna they are both called *muscardino* from their resemblance in figure and size. Of these two species we only know the latter, as the dormice of France have no smell either good or bad. Its flesh, however, is unfit to eat, and it never becomes so fat as the loir.

The dormouse becomes torpid with cold and revives in mild weather, and like the loir and lerot hoards up nuts and other dry fruits. It forms its nest upon trees, like the squirrel, though generally lower among the branches of nut-trees, and underwood; the nest is made of herbs interwoven, is about six inches in diameter and is only open at the top. Many countrymen have assured me that they have found the nests of dormice in coppices and in hedges, that they were surrounded with leaves and moss, and that each nest contained three or four young ones. As soon as they grow up they quit their
nests,

rests, shelter themselves in the hollows or under trunks of trees, where they repose, lay up provisions, and sleep through the winter.

THE SURMULOT.

THIS species of rat has been known but for a few years, and is not mentioned by any naturalist except M. Brisson, who calls it the Rat of the Woods, but as it bears a greater resemblance to the field-mouse, in colour and habits, than to the rat, I have termed it the Surmulot, or large Field-mouse. This animal is more strong and mischievous than the rat; it has reddish hair, long naked tail, the backbone is arched like that of a squirrel, its body is much thicker, and it has whiskers like a cat. It is but a few years since this species has been spread in the neighbourhood of Paris; from whence they came is not known, but they have multiplied prodigiously, which is not wonderful when it is considered that they produce from
twelve

twelve to nineteen young ones at a time. They were first discovered at Chantilly, Marly, and Versailles. From M. le Roi I received a great number of them both alive and dead, and he also favoured me by communicating the remarks he had made upon this new species. The males are larger, stronger, and more mischievous than the females. When pursued or endeavoured to be taken, they turn and bite the stick or hand which touches them: their bite is sharp and dangerous, for it is immediately followed by a considerable swelling, and the wound, though small, does not soon heal. They bring forth three times in a year, so that two individuals may produce 36 in twelve months. Some of the females which I received were with young, and as I kept them in cages, two or three days before they brought forth I observed them busily gnawing the wood of their cages and putting the pieces into a kind of order, making beds for their little ones.

The surmulot, in some of its habits, resembles the water-rat. Though they take up their residences any where, they seem to prefer the banks by the water; the dogs also chase them with the same furious eagerness as they do the water-rat. When pursued, and they can equally take to the water, or
shelter

shelter themselves in a thorny thicket, they prefer the former, plunge in without dread, and swim with great facility. This particularly happens when they cannot regain their burrows, for, like the field-mouse, they dig holes in the earth, or occupy those made by rabbits. They may also be taken by means of ferrets, who pursue them into their hole with the same ardour as they do the rabbit. These animals pass the summer in the country ; they live principally on fruits or grain, yet are carnivorous, devouring young hares, rabbits, partridges, and other birds, and when they get into a hen-roost they destroy, like the polecat, more than they can eat. About November the females and the young ones quit the fields, and proceed in troops to barns, where they commit infinite havock, by destroying the straw, consuming the grain, and infecting every thing with their ordure. The old males remain in the fields each in his respective hole, where they accumulate acorns, beech-mast, &c. filling it to the very edge, and remaining themselves at the bottom. They do not become torpid in the winter, like the dormouse, but come out of their holes every fine day. Those which reside in barns drive away all the
mice

mice and rats : and it has even been remarked, that the common rats are less frequent in the environs of Paris since the surmulot became so numerous.

THE ALPINE MARMOT.

OF all modern writers upon Natural History Gesner has done most to enlarge our knowledge in this science. Aldrovandus is little more than his commentator, and those of less repute are his mere copyists; we shall not, therefore, hesitate to follow him in treating of the Marmots, (*fig. 91.*) which are natives of his own country (Switzerland), and of which he must have been better informed than those who may have accidentally kept a few in their houses. And as his remarks perfectly coincide with those observations we had an opportunity to make, we can have no reason to doubt that what he further relates is equally to be depended upon. The marmot, when taken young, is easily tamed,

tamed ; more than most wild animals, and almost as much as our domestic ones. It is soon learnt to perform feats with a stick, to dance, and to readily obey the voice of its master. Like the cat it has an antipathy to dogs ; when it has become familiar in the house, and finds itself protected by its master, it will attack the largest dog, and fasten on them with his teeth. It is not quite so large as a hare, but more stout, and has great strength joined to peculiar agility. He has four strong teeth in the front, with which he bites terribly ; but unless provoked he neither attacks dogs nor men ; but if care is not taken he will gnaw furniture, and even make holes through wooden partitions. As his thighs are short, and his toes formed like the bear, he often sits erect, and walks with ease upon his hind feet ; he puts food to his mouth with the fore paws, and eats like a squirrel. He runs much swifter up hill than on a plain ; climbs trees, and mounts the clefts of rocks, or contiguous walls, with great facility ; so much so that it is said the Savoyards, who are the general chimney-sweepers of Paris, learned from the marmot their trade. They eat indiscriminately whatever is given them, whether flesh, bread, fruit, herbs, roots, pulse, or insects, but

of milk and butter they are particularly fond ; and, though less inclined to theft than the cat, they industriously endeavour to get into a dairy, where they will lap great quantities of milk, purring all the while like a cat when she is pleased. Milk, indeed, is the only liquid for which they shew any inclination, as they seldom drink water, and refuse wine.

There seems to be a combination of the bear and the rat in the form of the marmot, [yet it is not the *arctomys*, or *rat-bear* of the ancients, as Perrault, and several others have imagined. Its nose, lips, and form of the head, are like those of the hare ; it has the hair and claws of the badger, the teeth of the beaver, the whiskers of the cat, the eyes of the loir, the feet of a bear, with a tufted tail and short ears. The hair on its back is a reddish brown, more or less dark, and very harsh, that on the belly is reddish, and more soft. Its voice resembles that of a young dog when played with or caressed, but when irritated or frightened it raises a cry, so loud and shrill, that it hurts the drum of the ear. It is a very clean animal, and retires, like the cat, upon necessary occasions ; but, like the rat, it has a very strong disagreeable smell, especially in the summer. In autumn it is loaded with fat,

fat, though all parts of the body are never equally so. The back and reins are loaded with fat which is firm and solid; therefore the marmot would make very good eating, if it did not retain a disagreeable smell, which would require the strongest seasoning to conceal.

This animal, which delights in the regions of frost and snow, and which is only found on the highest mountains, is, of all others, most liable to be benumbed with the cold. About the end of September, or beginning of October, it retires to its hole, and appears no more till the beginning of April. His retreat is formed with precaution, and furnished with art. It is rather wider than long, and very deep, so that it will hold several of them without crowding, or injuring the air they breathe. Their feet and claws appear as if designed for digging, and with which they remove the earth with great facility, throwing it behind them as they proceed. The form of their hole resembles the letter Y; the two branches having an opening which terminates in one wherein they reside. As the whole is made on the declivity of a mountain there is no part on a level but the innermost apartment. One branch of the Y slopes downward, and in which they void their excrements, and the other slopes upwards,
and

and serves them as a door to go in and out. The inner part is warmly lined with moss and hay, of which they make an ample provision during summer. It is even asserted that this is a public work, that some cut the finest grass, that others collect it, and that they take their turns in conveying it to their hole; upon this occasion, it is added, that one of them lies upon his back, permits the hay to be heaped upon his belly, keeps his legs extended, and in this manner the others drag him by the tail to their common retreat; and this practice is assigned as the reason for the hair being generally worn away from their backs. But it appears more probable, that their being constantly employed in digging up the earth is the cause of that appearance. Be this as it may, certain it is that they dwell together, and labour in common to make their habitations, in which they pass three-fourths of their lives; they retire to it in stormy or rainy weather, and at the approach of danger; they never go out but in the finest weather, and even then to no great distance: on these occasions one stands as centinel upon an elevated place, while the others are sporting in the fields, or cutting the grass for hay, and no sooner does he perceive a man, an eagle, a dog, &c. than he gives the alarm

alarm by a kind of whistle, and is himself the last to enter the cell.

They make no provision for winter, as if they foresaw that such a precaution would be useless ; but when they perceive the first approaches of the season, in which they will be in a torpid state, they close up the entrance of their dwelling, and which they effect with so much solidity and care, that it is much more easy to dig up the earth in any other part. They are at this time very fat, and some of them will weigh twenty pounds ; in this plight they remain three months, after which they waste by degrees, and are quite thin by the end of winter. When discovered in their retreats they are rolled up like balls, and covered with hay ; in this state they may be taken away, and even killed, without shewing any sense of pain. The fattest are generally taken for food, and the young ones kept for taming. Like the dormouse they are revived by a gradual heat, and those kept warm in a house never become torpid, but are as lively in the winter as at any other time. We have already observed that the torpid state is occasioned by the congelation of the blood, and it is remarked in the Philosophical Transactions, No. 597, that when in this state of torpor, the circulation of the blood is slow, the secretions languid, and the blood

blood not being renewed by fresh acquisitions of chyle, is then without serum. Besides it is uncertain whether they remain for seven or eight months in a torpid state as most authors pretend. Their burrows are deep, and they live together in great numbers ; they therefore must retain their heat some time, and may then feed on the grass they have treasured up. M. Altman, in his Treatise on the animals of Switzerland, says, that the hunters let the marmots remain three weeks or a month unmolested in their cells ; that they never dig for them in mild weather, as without this precaution the animals awake, and penetrate deeper in the earth ; but that on opening their cells in hard frosts they find them in so torpid a state, as to be carried off without difficulty ; it may therefore be concluded that, in all respects, they resemble the dormice, and that if they are longer in a torpid state, it is because the winter is longer in the climates which they inhabit.

These animals produce but once a year, and rarely more than three or four at a time. They grow very fast, their lives do not extend beyond nine or ten years, and this species is neither numerous nor much diffused. The Greeks knew it not, or at least have not mentioned it. Pliny is the first who takes notice of it among the Latins under the name of *mus Alpinus*, or Alpine rat.

rat ; and, indeed, though there are many other species of rats in the Alps, there is none so remarkable as the marmot, or like it dwells upon the brow of the loftiest mountains ; all the other species fix their abode in the valleys, or at least on the sides of the lower hills or mountains ; besides the marmot never descends to the lower grounds but seem particularly attached to the Alpine heights, where it chooses such places as are exposed to the south or east in preference to the north or west. They are also found on the Appenine and Pyrenean mountains, and on the highest ones in Germany.

The Bobak of Poland, to which M. Brisson, and after him Mess. Arnault of Nobleville, and Salerne, have given the name of Marmot, differs from that animal in colour, and also in the number of toes, having five on the fore-feet. From which we may conclude that the *bobak*, or Polish marmot, the *mouax*, or Canadian marmot, the *cavia*, or marmot of Bahama, and the *cricet*, or Strasburgh marmot, are different species from the marmot of the Alps.

SUPPLEMENT.

I HAVE received the drawing of a *monax*, or marmot of Canada, from Mr. Collinson; but which appears to differ very much from the Alpine marmot, its head not being of the same shape, and less covered with hair, as is also the tail which is considerably longer. The *whistler* mentioned by Baron Hontan, as found in Canada, is most probably of this species, as his description nearly answers to it. He says it is called whistler by the Canadians, because in fine weather they whistle at the mouth of their holes ; which we have before remarked is done by our Alpine marmots, especially by the one appointed to stand as a guard.

An animal in Kamtschatka is called marmot by the Russian travellers : they say its skin is beautiful, and at a distance it resembles the plumage of a bird; and add, that it uses its fore-feet like a squirrel, and feeds on roots, berries, and cedar-nuts ; the latter however seems to indicate an

error

error, as the real cedar bears cones, and the other trees so called, berries.

There is another species which comes from the Cape of Good Hope; this was first spoken of by M. Allamand, but more fully described by M. Pallas, and M. Vosmaer, who had one of them alive at Amsterdam; he says it is known at the Cape by the name of the Rock Badger, merely because it lives under the earth and in rocks, but has no resemblance to that animal; and, as Kolbe justly remarks, that it resembles more the marmot than the badger, we have called it the Marmot of the Cape. M. Vosmaer observes in his description of it, that it was about the size of a rabbit, had a large belly, fine eyes, and black hair upon its eyebrows, above which it had a few long black hairs that turned towards the head, and long whiskers. Its colour was grey, or rather a yellowish brown intermixed with black hairs, much darker upon the head and back than upon the belly, which as well as the breast was whitish, and it had a white stroke across the shoulders which ended at the top of the fore-legs.

THE BEAR.

THERE is no animal so generally known, about which naturalists have differed so much as the bear, their doubts and even contradictions, with respect to the nature and manners of this animal, seem to have arisen from their not distinguishing the different species, and consequently ascribing to one the properties belonging to another. In the first place, the land-bear (*fig. 92.*) must not be confounded with the sea-bear, or as it is commonly called, the white bear (*fig. 93.*), or bear of the frozen sea; these animals being very different both in the form of their bodies and natural dispositions. The land bears must be also distinguished into two species, the brown and the black, because having neither the same inclinations nor natural appetites, they cannot be considered as varieties of the same species. Besides, there are some land bears that are white, but which, although they resemble the sea-bear in colour, differ from it in every other particular.



FIG. 93.

White Bear.



FIG. 92.

Brown Bear.

particular. These white land-bears we meet with in Great Tartary, Muscovy, Lithuania, and other northern countries. It is not the rigour of the climate which renders them white during the winter, like the hares and ermines, for they are brought forth white and remain so all their lives. We ought, therefore, to consider them as a fourth species, if there were not also found bears with an intermixture of brown and white, which denotes an intermediate race between the white land-bear, and the brown or black, consequently the former is only a variety of one of those species.

We frequently meet with the brown bear in the Alps, but the black-bear very rarely. But in the forests of the northern countries of Europe and America, the latter is very common. The brown one is both fierce and carnivorous, but the black-bear is only wild, and constantly refuses to eat flesh. Of this we cannot give a more striking testimony than what M. du Pratz relates in his history of Louisiana. “The bear, says he, (speaking of the black one) appears in Louisiana in winter, because the snows which cover the northern countries prevent him from procuring his usual food, which consists of roots, acorns, and vegetables in general; but milk and honey form his favourite repast,
and

and when he meets with those articles he will sooner die than relinquish them. In defiance of the prevailing notion that the bear is carnivorous, I maintain, with every person of this province, and the circumjacent countries, that he is not so. These animals have never been known to devour men, nor even to eat butcher's meat, notwithstanding their multitude, and the excesses of hunger which they often suffer. While I resided at the Natches, one winter was so severe in the northern regions, that the bears flocked from them in great numbers; so great indeed that they starved each other, and were very meagre. In the night they were frequently seen roaming into houses and farm-yards, which were not properly shut, where they might have feasted upon meat, but they never touched it, nor devoured aught but such grain as they could pick up. If they had possessed a carnivorous disposition, it must have shewn itself upon such a pressing occasion. They never kill animals to devour them; and were they in reality carnivorous, they would not abandon their own snowy regions, where they might find men and animals at discretion, to search for fruit and roots, an aliment which carnivorous tribes reject." M. du Pratz adds in a note, that since writing the above passage, he had learned, with certainty,

certainly, that in the mountains of Savoy there are bears of two sorts, the one black, like those of Louisiana, not carnivorous, and the other red, which are as much so as wolves.

De Hontan remarks in his travels that the bears of Canada are very black, but by no means dangerous, and that they never attack the human species unless when fired at and wounded. In another place he adds that the reddish ones are exceedingly mischievous, and that they uniformly attack the huntsmen, whereas the black ones fly from them. According to Wormius there are three kinds in Norway. The first (*Bressdiur*) is very large, not altogether black but rather brownish, is not destructive, but lives solely on herbs and leaves of trees; the second (*Ildgiersduir*) is smaller, blacker, and carnivorous, frequently attacking horses and other animals, especially in autumn; the third (*Myrebiorn*) is still smaller and mischievous, he feeds on ants and delights in demolishing their hillocks. It has been remarked, adds this author (but without any proof) that these three kinds copulate together and produce intermediate species; that those which are carnivorous attack flocks like the wolf, killing the whole and eating only one or two; that they also eat wild fruits, and that when the fruit of
the

the service tree is in season, they are the most dangerous, because it sets their teeth on an edge which can only be allayed by blood or grease. But the generality of what Wormius relates on this head is highly equivocal, for we have no example of animals whose appetites are so different as the two first, the one living on herbs, and the other on flesh and blood, copulating together and producing intermediate species. Besides he mentions the black bear as carnivorous, and the brown one as frugivorous, which is inconsistent with truth, and contradicted by facts. It is also to be observed that Father Rzaczynski, of Poland, and M. Klein, of Dantzic, in treating of the bears of their own countries, admit of but two species, the black and the brown, or red ; describing two kinds of the latter, the one large and the other small. They state the black bears to be rare, and the brown ones very common ; that the black kind are the largest and feed on ants, and that the largest of the red or brown are most carnivorous and destructive. These testimonies, as well as those of Du Pratz and de la Hontan are contradictory to what Wormius asserts. Indeed it seems to be a certain fact that the red or brown bears which are found not only in Savoy, but on the high mountains,

in

in the vast forests, and in almost all the desarts of the earth, devour live animals and even carcasses when in a putrid state. Black bears are seldom found in cold countries, but the red or brown ones we find in the cold, temperate, and even in the southern regions. In Greece they were common, and to heighten their shews the Romans introduced them from Lybia. They are now to be met with in China, Japan, Arabia, Egypt, and as far as the island of Java. Aristotle also speaks of white land bears, but considers this difference in colour as accidental, and originating from a defect in generation. Thus the bear is a resident in all desert, mountainous, and woody countries; but in open, populous, and cultivated regions he is a stranger. There are none in England or France, except possibly a few in the most unfrequented mountains of the latter.

The bear is not only a savage but a solitary animal; he takes refuge in the most unfrequented places, and dangerous precipices of uninhabited mountains: he chooses his den in the most gloomy parts of the forests, in a cavern hollowed out by time, or in the decayed trunk of some old tree. Thither he retires alone, and passes part of the winter without eating or ever stirring abroad. He is not,
however,

however, deprived of sensation, like the dormouse or marmot, but being exceedingly fat towards the end of autumn, which is the time he retires, he seems rather to subsist on the exuberance of his former flesh, and does not quit his retreat until he is nearly wasted. We are told that the male quits his den towards the expiration of forty days, but that the female remains four months, by which time she has brought forth her young; that they not only subsist but nourish their young, without taking any food for such a length of time I think highly improbable. I allow that when with young they are exceedingly fat, and also, that being covered with very thick hair, sleeping the greatest part of the time, and taking no exercise, they must lose little by perspiration. But, if it be true, that the males are impelled by hunger to quit their retreats at the end of forty days, it is not natural to imagine that the females should feel a less want of food, after bringing forth and suckling their young ones, unless we suppose that, like cats, they sometimes devour their offspring, of which, in my opinion, there is no probability. Besides, at present we speak only of the brown bear, the males of which do, in reality, devour their new-born cubs when they find them; but the females

females seem to love their offspring with a ferocious ardour. When they have brought forth their fury is more violent and dangerous than that of the males. They will expose themselves to any danger, they will combat any thing in defence of their young, which are not, as the ancients have said, without form when born, but attain their full growth nearly as soon as other animals; before they leave the womb their formation is perfect, and if the foetus, or young cub, seems at first glance to be unformed, it is merely because there is a want of proportion in the body and members of the grown bear; and that the foetus, or new-born animal, is more disproportioned than the aged, is well known to be the case in all species.

The bears couple in autumn; and the female is said to be more ardent than the male. It is pretended that she lies on her back to receive him, that she folds him with her paws, and holds him a long time, but the fact is they copulate like other quadrupeds. Bears, while confined with a chain, have been seen to copulate and produce, but how long the females go with young is not accurately known. Aristotle has limited it to thirty days, a fact which has never been contradicted, and which as I cannot authenticate, I will neither affirm

nor deny, but assign my reasons for thinking it doubtful; which are, first because the bear is a large animal, and the larger the animal the longer time is required for its formation in the womb; secondly, because the young bear is very slow of growth, follows the mother, and requires her succour for a year or two; thirdly, because the female produces only from one to four, and never more than five, a circumstance common to all large animals who produce but few and carry them long; fourthly, because the bear lives from 20 to 25 years, and the time of gestation, and that of growth, are usually proportioned to the duration of life. From these analagous principles I conclude that the bear carries her young several months. Be this as it may, the mother takes the greatest care of her offspring. She brings forth in winter, previous to which she provides a bed of hay and moss at the bottom of her den, and suckles her young till they are able to follow her in the spring. The male and female reside not together, but have separate retreats, and that at a distance from each other. When they cannot find a cavern for a den they break and collect branches which having placed they cover with herbs and leaves, so as to render it impenetrable to rain.

The

The voice of the bear is a kind of harsh deep murmur, which, when he is enraged, his heightened by the grinding of his teeth. He is susceptible of anger, which is always furious and often capricious. However mild, and even obedient he may appear to his master, he ought to be treated with distrust and circumspection; nor upon any account should he be struck upon the nose, or on the parts of generation. He may be taught to stand on his hind legs, and to dance in a rude and awkward measure; but for this it is necessary he should be taken young, and held in constant restraint. An old bear is not to be tamed, nor even held in awe, and shews himself, if not intrepid, at least fearless of danger. The wild bear turns not out of his path, nor offers to shun the sight of man; and yet, it is said, that by a certain whistle he is so far surprised and confounded as to rise upon his hind feet. This is the time to shoot and endeavour to kill him, for when only wounded in an attack he darts with fury on his foe, and clasping him with his fore paws is sure to stifle or strangle him, unless immediately assisted.

Bears are chased and taken in several manners; in Sweden, Norway, Poland, &c. the least dangerous method, it is said, is to intoxicate

toxicate them, by pouring brandy, or other spirits, upon honey, which being their favorite food they search for in the hollows of trees. In Louisiana and Canada, where the black bears are common, and where they reside in the decayed parts of old trees, they are taken by setting fire to their retreats, which, as they climb trees with great ease, are sometimes 30 or 40 feet high. If this attack be made upon a female with her young, she descends first and is killed before she reaches the ground ; as the cubs follow they are easily secured, by throwing a noose round their necks, and are carried home, either to rear, or kill for eating. The flesh of the young is delicate and good, and that of the old one eatable ; but as the latter is mixed with an oily fat, the paws alone, which are more firm, can be considered as a delicacy.

The hunting of the bear without being dangerous, is highly profitable, when attended with success ; of all coarse furs their skins are the most valuable, and the quantity of oil procured from one bear is considerable. The flesh and fat are boiled together, and then the oil is separated ; “ this done”, says Du Pratz, “ it is purified by throwing into it, while very hot a large quantity of salt and water ; a thick
smoke

smoke arises which carries off the disagreeable smell of the fat; when the smoke is evaporated they pour the grease, while still warm, into a pot, where it is left to settle for eight or ten days, at the expiration of which a clear oil is found swimming at the top; this is taken off with ladles, is equally good with the best olive oil, and is used for the same purposes. Under it remains a lard as white as hog's-lard, but rather more soft, and which has neither a disagreeable taste or smell." This account of M. du Pratz is perfectly acceded to by M. Dumont, who adds, that the savages of Louisiana carry on a considerable traffic with the French in this oil from the bears, that it never loses its fluidity but in intense frosts, when it becomes clotted, is of a dazzling whiteness, and is then eaten upon bread like butter. The author of the *Dictionnaire du Commerce* says, that good bear's-grease should be grey, viscid, and of a disagreeable flavour, and when very white it is adulterated with suet. It is used as a topical remedy for tumours, rheumatic, and other complaints, and many people have a high opinion of its salutary properties.

From their great quantity of fat, bears are excellent swimmers. In Louisiana, Dumont says, they cross that great river with perfect ease; they

they are very fond of the fruit of the *guaiacana*, the trees of which they climb, and sit astride upon the branches to eat it ; they are also partial to potatoes and yams. In autumn they are so fat that they can hardly walk, at least they cannot run as fast as a man ; it is sometimes ten inches thick on their sides and thighs. The under part of their paws is large and swelled, and when cut there issues out a white milky juice. This part seems composed of glands resembling small nipples, and this is the reason why they continually suck their paws when confined to their dens during winter.

The bear enjoys the sense of seeing, hearing, and feeling, in great perfection, although compared with his size, his eye is small, his ears short, and his skin coarse and covered with a quantity of hair. His smell, is, perhaps, more exquisite than that of any other animal ; the internal surface of his nose being very extensive and excellently calculated to receive impressions from odoriferous bodies. Their legs and arms are fleshy, like those of man, and they strike with their paws in the same manner as he does with his fists ; they have also a short heel bone, which makes part of the sole of the foot ; in their kind of hands the thumb is not separated, and the largest finger is on the outside ;
but

but whatever rude resemblance they may have to the human species, they only render them the more deformed without giving them the smallest superiority over other animals.

SUPPLEMENT.

SINCE the publication of the original work I have received the following particulars from M. de Musly, a major in the service of the States General. He says, that at Berne, they have several bears in a kind of domestic state, which are kept in large square ditches lined at the sides and bottom with stone, and where they have room to walk about they have dens made for them, which are also paved, on a level with the bottom of the ditch ; these are divided into two by walls, and are occasionally shut with iron gates ; troughs of fresh water are set for them in each ditch, and holes are left in the pavement sufficient to set up large trees on an end. Thirty-one years since two young brown bears were brought thither from Savoy,

Savoy, the male of which was killed by a fall from one of the trees into the ditch about two months ago (this account is dated October 17, 1771), and the female is still alive. At the age of five years they began to generate, and from that time they regularly came in season in the month of June, and the female brought forth in January. The first time, she had only one; since she has had from one to three, but never more; the three last years she had one each time, and the man who looks after her thinks she is now pregnant. When first whelped they are yellow, and white round the neck, and have not the smallest appearance of bears; they are blind four weeks; they measure about eight inches at first, and at the end of three months fourteen or fifteen; they are then almost round, and have a sharp pointed snout; they are by no means strong until they are full grown, before which time the white hair is quite gone, having decreased by degrees, and the yellow is changed into a brown.

The male and female sometimes fight furiously, growling horribly at each other, but when in season the latter generally gets the better. The ditches in which these two bears were formerly kept, being to be filled up, they were

were necessarily separated for a few hours while removing to the other ditches prepared for them ; on their meeting again they raised themselves on their hind legs, and embraced each other in a kind of rapture ; and upon the death of the male, the female was much affected, and refused to eat for several days. But this attachment is not common to them, for unless brought up and fed together from very young cubs they cannot bear each other ; yet after living thus together, the survivor will not admit the approaches of another. They are very fond of climbing the trees put into the ditches, which are green larches, and placed there every May. They are commonly fed with rye-bread soaked in water ; and they will eat all sorts of fruits. When the female is near her time, she is furnished with plenty of straw, which she appropriates for her use, and then the male is removed, lest he should devour the young ones ; they are allowed to remain with their mother for the space of ten weeks, when they are removed, and fed for some time with bread and biscuit.

M. de Musly afterwards informed me that the female they had thought pregnant was supplied with straw at the necessary time, but though she made a bed and rested upon it for

three weeks, she did not bring forth any thing; therefore the last time she brought forth she had but one, and was at the age of thirty-one years. He likewise adds, that there are brown bears on Mount Jura, in Franche-comté, and in the county of Gex, which come into the plains in autumn, and do great damage in the chesnut woods.

There are two species of bears in Norway, one of which is much smaller than the other; in both there are different colours, such as dark and light brown, grey, and every shade of white, at least so says Pontoppidan; and also that they retire to the dens which they have prepared in October. Being very formidable, when wounded, three or four hunters usually go together, and as he easily kills large dogs, they use small ones, which run under his belly and seize him by the genitals; when nearly overpowered, he places himself against a tree, and throws tufts or stones at his foes, until he is dispatched.

In the menagerie of Chantilly there is an American bear, with fine, soft, straight black hair, whose head is longer, and snout shorter than the bears of Europe. And M. de Bertram mentions a bear that was killed near St. John's
river

river in East Florida, which was seven feet long, weighed 400lbs. and from which 60 Paris pints of oil were drawn.

THE BEAVER.

AS man becomes civilized and improved, other animals are repressed and degraded. Reduced to servitude, or treated as rebels, and dispersed by force, all their societies are dissolved, and their talents rendered nugatory; their arts have disappeared, and they now retain nothing but their solitary instincts, or those foreign habits which they have acquired by example or human education. For this reason there remain no traces of their ancient talents and industry, except in those countries where man is a stranger, and where, undisturbed by him for a long succession of ages, they have freely exercised their natural talents, brought them to their limited perfection and been capable of uniting in their common designs. The beaver seems to be the only remaining

maining monument of that intelligence in brutes, which though infinitely inferior in principle to that of man, supposes common projects and relative views; projects which having society for their basis, and for their object the construction of a dike, the erection of a residence, or the foundation of a republic, imply some method of understanding each other, and of acting in concert.

The beaver is said to be among quadrupeds what the bee is among insects. Of societies there are three species in nature which we ought to consider attentively before we begin to compare them; namely, the free society of man, to which, next to God, he is indebted for all his power; the constrained society of large animals, always rendered transitory by the human species; and the forced society of certain little animals, which, coming into existence at one time, and in the same place, are obliged to live together. An individual, solitary as he comes from the hands of the Creator, is a sterile being, whose industry is confined to the use of his senses; nor is man himself, in a state of pure nature, unassisted by the aids of society, capable of multiplying or of being edified. All society, on the contrary, necessarily becomes fruitful, provided it be composed

composed of beings of the same nature. From the necessity of seeking or avoiding each other, a succession of common movements will follow, from which frequently some work will result that has the appearance of having been conceived, conducted, and executed with intelligence. Thus the labours of the bee, which in a given place, such as a hive, or the hollow of an old tree, forms its own cell; those of the Cayenne fly, which is not only the architect of its own cell but the hive which is to contain it, are labours purely mechanical, and suppose no intelligence, no concerted project, no general views, but nothing more than physical necessities. A result of common movements, is at all times and places, performed in the same manner, by a swarm of little creatures not assembled from choice, but united by the force of nature. It is not society but numbers that operate in this case; it is a blind power which cannot be compared to that light by which all society is directed; I speak not of that pure light, that ray of divinity which has been communicated to man alone, and of which the beaver is certainly as destitute as any other animal. As their society is formed rather by a kind of choice than necessity, so it supposes at least a general concurrence

currence and common views ; it implies also a beam of intelligence, which, though widely different from that of man in principle, produces effects so similar as to warrant a comparison, not indeed with society, as it is found among civilized nations, but as it appears among savages just emerging from absolute solitude ; a society which, with propriety, can alone be compared with that of animals.

Let us then examine the produce of these societies, let us inquire how far the art of the savage extends, and where the talents of the beaver is limited. To break down a branch, to use it as a staff, to build a hut and cover it with leaves for shelter, to collect moss or hay, and to make a bed of them, are acts common to the animal and to the savage. To rub a stone so as to render it an edged instrument for cutting or stripping the bark of trees, for sharpening arrows, for flaying an animal, in order to make a covering of its skin ; to make bow-strings of its sinews, to fix those sinews to a thorn or bone, and use them as needles and thread, these are acts which may all be performed by a man in a state of solitude, and without assistance from others, since they depend solely on his conformation, and only suppose him to have the use of his hands. But,
to

to cut down, and transport a large tree, to raise a mole, or build a village, are, on the contrary, operations which necessarily suppose common labours and concerted views; these are the only performances which result from immature society in savage nations; while the operations of the beavers are the fruits of a perfected society among those animals; for it is to be observed, that they never attempt to build but in countries where they are in no danger of having their tranquillity interrupted.

There are beavers in Languedoc, in the islands of the Rhone, and many in the northern provinces of Europe; but as all those countries are inhabited, or at least frequented by men, the beavers there, as well as all other animals, are dispersed, forlorn, and timid creatures. There they have never been known to assemble, or undertake any common work: whereas in desert regions, where human society was formed later, where some few vestiges of savages alone could be traced, beavers were every where seen united, forming societies, and constructing works which were the admiration of every beholder. Of this I shall endeavour to quote such testimonies as are most judicious and least liable to censure, and shall only consider as certain those facts which are confirmed
by

by common consent. Less inclined to indulge admiration, perhaps, than some writers, I shall not hesitate to doubt, and even to criticise, whatever may seem too improbable to demand our belief.

It is generally allowed that the beaver, far from having a superiority over other animals, seems to be inferior to many of them, in his merely individual qualities; and this fact I am enabled to confirm, by having had a young beaver, which was sent me from Canada, in 1758, alive in my possession for more than a twelvemonth. This animal is mild, peaceable, and familiar; it is rather inclined to be gloomy and melancholy; it has no violent or vehement passions, its movements are slow, it makes few efforts, unless to gain its liberty, which it frequently attempts by gnawing the gate of its prison, but without violence or precipitation. In other respects it seems to be perfectly indifferent, forming no attachments,* and is as little inclined to offend as to please. He is inferior to the dog in the relative qualities which might make him approach to man; he appears formed neither to serve, command, or even to
associate

* M. Klein, however, says that he kept a beaver for several years, which followed and would go in quest of him, as dogs search for their masters.

associate with any species but his own. His talents are repressed by solitude, and it is by society with his own kind they are brought into action. When alone he has little industry, few tricks, and not sufficient distrust to avoid the most obvious snares. Far from attacking any other animal, he has scarcely art to defend himself; always preferring flight to combat, he only resists when driven to an extremity, and then bites very hard with his teeth.

If then we consider this animal, in a state of nature, or rather in his dispersed and solitary state, we shall find that his internal qualities are not superior to other animals; he has not the genius of a dog, the sense of an elephant, nor the cunning of a fox; and he is rather remarkable for external singularities than for any apparent superiority of internal qualities. The beaver is the only animal who has a flat, oval tail, covered with scales, which serves as a rudder to direct his course in the water; the only one that has his hind-feet webbed, and the toes of his fore-feet separate, which he uses to convey food to his mouth; the only one which resembles a land animal in the fore parts, and approaches the nature of an aquatic one in the hinder, in short he forms the same shade between quadrupeds and fishes, as the bat

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forms between quadrupeds and birds. But these singularities would be rather defects than perfections, if the beaver did not derive from this conformation peculiar advantages which render him superior to all other animals.

The beavers begin to assemble in June or July in order to form themselves into a society. They arrive in numbers from all sides, and soon form a company of two or three hundred; the place of meeting is generally that where they intend to fix their abode, and is always by the side of some lake or river. If it be a lake wherein the waters always remain upon a level they dispense with making a dam; but if it be a running stream, subject to floods and falls, they build a bank or pier quite across so as to secure a piece of water always at the same height, and this bank is frequently from 80 to 100 feet long, and ten or twelve thick at the base. If we compare the greatness of the work with the size* of the architect, it will appear enormous, but the solidity with which it is constructed is still more astonishing. They commonly choose that part of the river which is most shallow, and if possible, where some
large

* The largest beavers weigh from 50 to 60 pounds, and are seldom more than three feet in length, measuring from the tip of the nose to the insertion of the tail.

large tree is growing by the side of the stream; this they instantly set about cutting down, and although it is sometimes much thicker than a man's body, they very soon accomplish it without any other instrument than their four incisive teeth; and they always contrive to make it fall across the stream; they next cut off the top branches to make it lie level. These operations are performed in common. Several are employed at the foot of the tree in gnawing it down, others sever the branches, while others are, at the same time, engaged in parties along the banks of the river in cutting smaller trees, from the size of a man's leg to that of his thigh; these being cut to a certain length, they drag, by land, to the brink of the river, and then by water to the place allotted for their building; having pointed them at one end, they sink them down at small distances from each other, and then interweave them with pliant branches; the placing of these piles is the most difficult part of their operations, but they accomplish it by one party supporting the thick end with their teeth, while others plunge to the bottom and dig holes with their feet to receive the points that they may stand upright. While some are thus employed, others bring earth and clay, which they prepare for their
purpose

purpose with their feet and tails ; and they transport it in such large quantities, that they block up all the intervals between the piles. These piles are formed by a number of stakes in several rows, exactly of a height ; they are placed opposite to each other, and extend across the river : that this embankment may sustain the weight of the water, it is made sloping, so that although it is twelve feet at the base, it is not more than three at the top ; from which ingenious contrivance it has not only the requisite thickness and solidity, but also a form of others the most proper for confining the water, maintaining its weight, and baffling its attacks. Near the top of this bank they make two or three openings for the superfluous water to escape, and which they occasionally enlarge or contract as the river rises or falls ; and when by any sudden inundations their work is damaged on the retreat of the waters they repair it with the utmost diligence.

After this display of their public labours, it would be superfluous to add a description of their private constructions, were it not necessary that, in history, an account should be given of every fact, and where not this first great work of the beaver, made with an uniform intention to render their smaller habitations more commodious.

commodious. These habitations are partly built upon piles on the banks of the river, and have two openings, one for the purpose of land, and the other for water excursions; they are either round or oval, and are of various sizes, from four to eight or ten feet in diameter; some of them consist of three or four stories, and their walls are about two feet thick, raised upon planks, which serve at once for foundations and floors. When they consist of but one story, the walls are only a few feet perpendicular, and then raised in a curve, which terminates in a dome or vault, and serves as a covering. They are constructed with such solidity as to be impenetrable to the heaviest rains, to defy the most impetuous winds, and are plastered with excessive neatness, both within and without; as much so as if they were actually done by the hand of man; yet they use no other instrument for the preparation of this mortar than their feet, or for its application than their tails. They chiefly use wood, stone, sandy earth, and such materials as are not easily dissolved with water; for the wooden work they take such trees as grow on the banks of rivers, which are more easily cut down, stripped of their bark, and carried, than solid timber, all which they are sure to accomplish
upon

upon a tree which they have once attacked. They begin to cut a tree at the distance of a foot, or a foot and a half from the ground, and they sit as they work, for besides the advantage of this convenient posture, they have the pleasure of continually gnawing fresh bark and soft wood, both of which they prefer to most other kinds of aliment; and of these they provide an ample store for their subsistence during winter*, being averse to dry wood. It is in the water, and near their habitations, that they establish their magazines; there is one allotted to each cabin, proportioned to the number of its inhabitants, to which they have all a common right, and never plunder their neighbours. Some hamlets, if we may so call them, are composed of 20 or 25 cabins, but such large settlements are rare; generally they do not consist of more than ten or a dozen families, each of which has its own district, magazine, and habitation; nor will they allow strangers to come into their neighbourhood. The smallest dwellings contain two, four, or six; and the largest eighteen, twenty, and it is even asserted thirty beavers; and it very seldom happens, that the males and females are not of an equal

* The space allotted for the provision of eight or ten beavers is from 25 to 30 feet in length, and eight or ten feet broad and deep.

equal number. Moderately speaking, therefore, their society may be said frequently to consist of 150 or 200, who having at first exerted their united industry in raising a great public work, afterwards form themselves into different bodies to construct private habitations.

However numerous the society may be, peace and good order are uniformly maintained; their union is strengthened by a common quantity of toil, and confirmed by the conveniences they have jointly procured; and the abundance of provisions which they amass and consume together, render them happy within themselves. Having moderate appetites, and an aversion to flesh and blood, they have not the smallest propensity to hostilities or rapine, but actually enjoy all those blessings which man knows only how to desire. Friends to each other, if they have threatened enemies abroad they know how to avoid them; and on the first alarm they give notice of their mutual danger by striking the water with their tail, the sound of which is heard in their most distant dwellings; immediately each provides for himself as he thinks most expedient; some plunge into the water, others conceal themselves within the walls of their own habitations, which is in no danger but

but from the fire of heaven, or weapons of man, and which no animal dares attempt to open or overturn. These asylums are not only secure but neat and commodious. The floors are covered with verdure ; young branches of the box and fir serving them for carpets, and upon which they do not suffer the smallest dirt. The window that fronts the water they use as a balcony to enjoy the fresh air, and to bathe, which they do the greatest part of the day, sitting in an upright posture in the water, with their heads and fore parts only visible. This element appears so necessary, or at least so pleasing, that they seem unable to do without frequent immersions in it ; therefore, in making this window, they are very careful to guard against its being blocked up by the ice ; when the river is frozen over, they make an opening in it, and swim a considerable way under the ice ; at which times they are easily taken, by attacking the dwelling on one hand, and at the same time lying in wait for them at a hole purposely made in the ice at some distance, and to which they are obliged to come for breath. The habit of continually keeping their tails and hinder parts in the water, seems to have changed the nature of their flesh : that of the fore parts, as far as the reins, has the taste
and

and consistency of the flesh of land-animals, while the tail and posteriors have the smell, savour, and other qualities of fish. As for the tail it is even an extremity, an actual portion of a fish fixed to the body of a quadruped; it is a foot long, an inch thick, and five or six inches broad; it is entirely covered with scales, and has a skin altogether the same as that of a large fish. These scales may be scraped off with a knife, and then the impressions are to be seen on the skin as in all scaly fishes.

It is in the beginning of summer that the beavers assemble; they employ July and August in the construction of their banks and habitations; in September they collect their provisions of bark and wood, and afterwards, enjoying the fruits of their labour, they experience the sweets of domestic tranquillity; this is the time of repose, and what is more the season of love. Acquainted with, and prepossessed in favour of each other, from habit, from the pleasures and fatigues of a common labour, no couple is formed at random, nor by physical necessity, but by inclination and choice. Happy in each other, they pass the months of autumn and winter together, and scarcely ever separate. With every thing at home they can wish for, they never go out but upon agreeable and useful

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ful excursions ; on which occasions they bring home fresh bark, which they prefer to what is too dry, or has been too much soaked in water. The females are said to go four months with young ; they bring forth towards the close of winter, and have two or three at a time. Nearly at this period the males leave them, and retire into the country to enjoy all the sweets of the spring ; they pay occasional visits to their habitations, but reside there no more. The females, however, remain in them employed in sucking, tending, and rearing their young, who are in a condition to follow them at the expiration of a few weeks ; at which time they, in their turn, make some excursions, feeding on crabs, fishes, and bark of young trees ; and pass the whole of the summer upon the water or in the woods. They are not thoroughly collected again till autumn, unless their bank, or dwellings, should happen to be damaged by an inundation, in which case they assemble betimes to make the necessary repairs. They are more fond of residing in some places than others, and have been observed to return every summer, after their works have been repeatedly demolished, to repair them, till harassed by this persecution, and weakened by the loss of several of their troop,

troop, they have, with one consent, deserted it, and retired to some more secure and less frequented neighbourhood.

Winter is the season principally allotted for hunting them, as it is then only that their fur is in perfection; and when, after their dwellings are demolished, a number of them are taken, their society is never restored; but those which escape captivity or death, become houseless wanderers. Their genius is overcome by apprehension, and they never more attempt to exert it, but conceal themselves in holes underground, and reduced to the condition of other animals, they lead a timid life, employing themselves only to satisfy their immediate and urgent wants; nor do they any longer retain those qualities which they so eminently possess in their social state. However marvellous the description we have just given of the society of the beaver may appear, it is beyond a doubt strictly consonant to truth. A number of ocular witnesses have agreed in their writings to every fact I have mentioned; and if the present recital differs from some authors whom I have followed, it is only in such points as appeared to me to be too marvellous and improbable to be believed. Many writers, not content with ascribing to the beaver social manners, and evident talents for architecture,

ture, have attributed to them general ideas of policy and government. They have asserted that when their society is formed, they reduce travellers and strangers of their own species into slavery ; that they employ them in carrying their clay and wood ; that they treat in the same manner the idle who will not, and the old who cannot, work ; that is, they throw them upon their backs, and use them as so many vehicles to carry their materials ; that they never assemble in an even number, for the purpose of having, in all their deliberations, a casting voice ; that each tribe has its peculiar chief ; that they have sentinels established for the public security ; that when chased they tear off their testicles to satisfy the avarice of their pursuers ; that when thus mutilated they turn about and present themselves to obtain mercy,* &c. Although we discredit these exaggerations, yet we must not reject those facts which have been established by moral certainties. A thousand times have the works of the beaver been viewed, overturned, measured, designed, and engraved ; and every doubt is banished, by some of their fabrics still subsisting ; for though less common than when North America was first

* This is affirmed by *Ælian*, and all other ancient writers, Pliny excepted, who absolutely denies it.

first discovered, the latest missionaries and travellers, who have visited the northern parts of that continent, unanimously concur in having met with them.

We are told by these that, besides the beavers who live in societies, there are others which lead a life of solitude; having been rejected from the body, for being guilty of some crime against it, and therefore are not allowed to partake of its advantages; they have neither house nor magazine, and are forced to live, like the badger, in holes under ground. They are easily distinguished, from their coats being always dirty, and their hair rubbed off by the friction of the earth. Like the otters they inhabit the edge of rivers, where some of them dig a ditch several feet deep, in order to make a pond that may reach to the mouth of their hole, which has an internal ascent; there are, however, others which live at a considerable distance from the water. All the European beavers are solitary, and their fur is by no means so fine as that of those who live in society. They differ in colour according to the climate they inhabit. In the northern countries they are black, and those are the finest, although among those there are some found entirely white, some grey, and others with red spots.

The

The further they are removed from the north the more bright and varied we find their colour. In the north part of Canada they are chesnut, and among the Illinois they are yellow, or olive-coloured. There are beavers in America from the 30th degree of north latitude to beyond the 60th. They are common in the north part, and gradually decrease towards the south. This is also the case in the Old Continent; we never find them numerous except in the northern countries; in France, Spain, Italy, Greece, and Egypt, they are very rare. They were known to the ancients, and by the religion of the Magi it was forbidden to kill them. Upon the borders of the Euxine sea they were common, and were called *canes pontici*; but it is probable they did not enjoy much tranquillity in the neighbourhood of this sea, (which from the earliest time has been frequented by mankind) since none of the ancients speak either of their society or labours. Ælian, in particular, who had such a propensity to the marvellous, and who I believe was the first who mentioned their dismembering themselves to delay the hunters, would never have omitted enlarging on the wonders of their republic, and genius for architecture. Would Pliny, whose bold, gloomy, and sublime genius

was

was always bent upon degrading man to exalt Nature ; would he have forborne to have compared the labours of Romulus with those of the beavers ? It seems, therefore, that their industry, and talents for building were unknown to the ancients ; and although in latter ages, beavers have been found in Norway, and other northern parts of Europe, with habitations of their own construction ; and though there be no reason to doubt the ancient beavers did not build as well as the modern, yet as the Romans did not penetrate so far north, it is not surprising they should have been unnoticed by their writers.

Several authors have said, that the beaver, being an aquatic animal, could not live solely on land ; but this opinion is erroneous, for the young beaver sent me from Canada was reared in the house, and when taken to the water was afraid of it, and refused to go in ; when plunged into the bason, there was a necessity to hold him there by force ; but in a few minutes he became perfectly reconciled ; afterwards, when left to his liberty, he would frequently return to it of himself, and even roll upon the dirt and wet pavement. One day he escaped and descended by a stair-case into the subterraneous vaults in the Royal Garden, and swam a considerable time in
the

the stagnant water at the bottom of them, yet no sooner did he see the light of the torches, which were brought to search for him, than he returned, and suffered himself to be taken without the smallest resistance. He is familiar without fawning, and is sure to ask for something to eat from those he sees at table, which he does by a small plaintive cry, and some gestures with his fore paws. When he obtains a morsel he carries it off and conceals it, that he may eat it at his ease. He sleeps pretty often, and then lies upon his belly. No food comes amiss to him, meat excepted, which he constantly refuses either raw or dressed. He gnaws every thing he comes near, and it was found necessary to line with tin the barrel in which he was brought over.

Though the beavers prefer the borders of lakes, rivers, and other fresh waters, yet they are sometimes found on the sea-shores, especially mediterranean gulphs, which receive great rivers, and where the waters are less salt. They are professed enemies to the otters, whom they hunt, and will not even permit them to appear in the waters which they frequent. The fur of the beaver is more beautiful and thick than that of the otter ; it is composed of two sorts of hair, the one short, bushy, soft as down, and impenetrable

netrable to the water, which immediately covers the skin; the other longer, bristly, and shining, but thinner, which serves as an upper coat, and defends the former from filth and dust. The latter is of little value, it is the first alone which is used by our manufacturers. The blackest furs are generally thickest, and consequently most esteemed; nor is the fur of the solitary beavers equal to that of those who live in society. These animals, like all other quadrupeds, shed their hair in summer, and therefore the furs of such as are taken in that season are of little value. The fur of the white beaver is esteemed because of its rarity; and the perfectly black is nearly as uncommon as the white. But, independent of the fur, which is the most valuable article, the beaver furnishes a substance which has been considerably used in medicine; it is known by the name of *castoreum*, and is contained in two large bladders, and which the ancients mistook for the testicles of this animal; but as they are to be found in every pharmacopæia, it is unnecessary to give here a description of them or their uses*. The savages are said to obtain an oil from the beaver's tail, which

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they

* It is pretended, that the beavers extract this liquid by pressing the bladders with their feet, and that it gives them

they apply as a topical remedy for different complaints. The flesh of this animal, though fat and delicate, is yet bitter and disagreeable to the palate. It is affirmed that its bones are of an excessive hardness, a circumstance which we are unable to determine, having never dissected but one, which was very young. Their teeth are very hard, and so sharp, that the savages use them to cut, hollow, and polish their wood; they also clothe themselves with its skin, and in the winter wear it with the hair next their bodies.

The beaver uses its fore-feet like hands, with as much facility as a squirrel; the toes of the hind-feet being connected by a strong membrane, supply the place of fins, and expand like those of a goose, which the beaver somewhat resembles in its walk. He swims much better than he runs; and as his fore-legs are much shorter than his hind ones, he always moves along with his head very low and his back arched. His senses are very acute, and that of smelling so delicate, that he will not permit any dirt or filth to remain near him. When kept in confinement too long, and he is under the
necessity

an appetite when disgusted with food, and that the savages to entrap them, wet the snares with it. But it is more certain, that the animal uses it to grease its hair.



FIG. 94.

Beaver.



FIG. 95.

Raccoon

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necessity of voiding his excrements, he drops them close to the threshold of the door, and as soon as that is opened pushes them out. This habit of cleanliness is natural to them, and our young beaver never failed to purify his apartment in this manner. At the age of one year he gave a sign of ardour for a female, which seems to be a proof he had then nearly attained his full growth; therefore their duration of life cannot be very long, and it is probably wrong to extend it to fifteen or twenty years. The beaver I had was very small for his age; a circumstance that is not surprising, since he had been in perpetual confinement from his earliest days, and from being unacquainted with water until he was nine months old, he could be expected to grow and expand like those who, while they enjoy their liberty, range at pleasure in that element which seems to be almost as necessary to them as that of land.

SUPPLEMENT.

IN confirmation of our former remarks that beavers might be easily tamed, M. Kalm, in his *Voyages*, says, that he had seen beavers so
tame

tame that they would go out to fish and bring the prey home to their masters ; nay that they would even follow men and dogs, go with them into their boats, jump into the water, and soon come up again with fish. And M. Gmelin affirms that he saw a beaver in Siberia, which had been reared in the house, who would go to considerable distance, and sometimes returning with a female whom he would suffer to go away by herself after the season of love.

THE RACCOON.

SEVERAL authors have described this animal under the name of *coati*, yet I have chosen to adopt the name given to it in England, that it may not be mistaken for, and confounded with, the real *coati*, or the *coati-mondi*, which appears to be nothing more than a variety of that species.

I had a raccoon (*fig. 95.*) alive, and which I kept more than twelve months ; he was about the size of a small badger, his body short and

and bulky, his hair long, thick, black at the points, and grey underneath ; his head was like that of a fox, but his ears round and shorter ; his eyes were large, and of a yellowish green, and over them a black band went across ; his snout was sharp, and his nose rather inclined upwards ; his under lip was less prominent than his upper one ; he had like the dog, six incisive and two canine teeth in each jaw ; his tail was bushy but tapering towards the point, marked with alternate black and white rings from one end to the other, and was at least as long as the body ; his fore legs were much shorter than his hind ones, and each had five toes armed with strong sharp claws. He used his fore feet to hold his food while eating, but his toes not being flexible he could not grasp any thing with one paw, but was obliged to use them both when food was presented him.

Though the raccoon is short and bulky he is very active ; his pointed claws enable him to climb trees with great facility ; he runs up the trunk with ease, and frolicks to the extremities of the branches in perfect security. On the ground he rather bounds than runs, and his motions, though oblique, are always quick and light. He is a native of the southern parts of America, nor has ever been found
upon

upon the old continent, at least if we may judge from the entire silence of travellers about him. In the regions of America, he is, however, very common, particularly in Jamaica, where he resides in the mountains, from whence he often descends to feed upon the sugar-cane. He is not met with in Canada, nor in the northern parts of the continent; and yet he is not afraid of cold. M. Klein reared one at Dantzic; and the one I had, passed a whole night with his feet in the ice, without being incommoded.

Every thing which is given him to eat he dips in water, especially bread, which he will not take out again, unless pressed with hunger before it is perfectly soaked; but when very hungry he will eat dry food, and any thing presented to him. He searches about in every corner, and eats every thing he meets with, whether flesh, dressed or raw, fish, eggs, live fowls, corn, roots, &c. He likewise devours insects, is fond of hunting spiders, and when at liberty in a garden, snails, worms, and beetles, are his favorite prey. He is exceedingly fond of sugar, milk, and other kind of sweet aliments, fruit excepted, to which, however, he prefers either flesh or fish. He retires to void his excrements; is a familiar and even fawning animal;

mal ; mine used to jump on those he loved, and to frisk and play about them chearfully ; he was cleanly, always in motion, and seemed to possess much of the nature of the maki, and some of the qualities of the dog.

SUPPLEMENT.

A letter I received from M. Blanquart des Salines, dated October 39, 1775, contained many particulars concerning the raccoon. This gentleman says that the one in his possession had constantly been kept chained, in which state he appeared gentle, yet shewed no inclination to be fond, but whenever he procured his liberty his docility disappeared, and on one occasion they had great difficulty to secure him again. M. Salines, however, often permitted him to go about with his chain loose, for which he would appear very grateful, but that 'was not the case whenever he procured his own liberty, as he would then roam about for three or four days together, and do a great deal of mischief, by getting into the hen-houses
in

in the night, killing all the poultry, and eating only their heads. When chained he would use much art, permitting the fowls to partake of his food, until supposed security had put them off their guard, and they came within his reach, when he would seize and tear them to pieces. He opened oysters with great dexterity, putting them under his hind feet, and then entering the weakest part with his fore claws separated the shells in an instant : he performed this, as well as all other of his operations, by feeling alone, seldom making use either of his eye or his nose. He does not appear to have much gratitude for favors, but is very revengeful if ill treated, for a servant having given him a few strokes with a whip, he would never afterwards suffer him to come near without expressing the utmost rage ; flying at the man, making the most violent cries, and refusing everything offered until he disappeared. When attacked by any thing stronger than himself he makes no resistance, but rolls himself up something in the manner of a hedge-hog, and in which state he will even suffer himself to be killed without uttering the smallest complaint. He never lies upon any bed, but invariably turns out the straw, or any thing put into his house to answer that purpose. He does not
appear

appear to be affected with cold, nor solicitous for warmth, for he has been covered with snow without injury, and one frost, on being presented with warm water and some almost frozen, for him to soak his food, he always used the latter; and notwithstanding he might have gone into the stable to sleep, he generally preferred a corner in the yard. He never wets fresh or bloody meat, but every thing that is dry he puts into water. He has an utter dislike to children, their crying puts him into a passion, and he would fly upon them if possible; this seems to spring from an abhorrence of sharp sounds, for he often chastised a small bitch, of which he is very fond, if she barked too loud.

THE COATI.

THIS animal has been called by many authors the Coati-mondi; I have had it alive; and, by comparing it with the coati mentioned by Thevet, and described by Marcgrave, I do not doubt that they are varieties of the same

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species

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species ; indeed Marcgrave after having given a description of the coati, says there are others of a blackish brown, and which, for the sake of distinction are called *coati-mondi* at Brasil. As the colour of the hair then is the only difference between them, they certainly ought to be considered as mere varieties of the same species.

The coati (*fig. 96.*) is very different from the animal described in the preceding article. He is of a smaller size than the raccoon ; his body and neck, head and nose, are of a longer form ; the upper jaw is terminated by a snout, which extends an inch, or an inch and a half, beyond the lower one ; and this snout, which is moveable in every division, turns up at the point. The eyes of the coati are also smaller than those of the raccoon ; his ears are shorter ; his hair longer and coarser ; his legs shorter ; his feet longer ; but, like the raccoon, his tail is diversified with rings,* and to all its feet there are five toes.

Some authors suppose that the sow badger, and the *taxus suillus*, of which Aldrovandus has given a figure, to be the same as the coati ;
but

* There are some coatis which have the tail of one uniform colour, but as they differ in no other particular, they can only be considered as varieties of the same species.



FIG. 98

Agouti



96

FIG.

97

Brown Coati

Black D'

but if we consider that the sow-badger, of which hunters speak, is supposed to be found in France, and even in some colder climates of Europe, and that, on the contrary, the coati is only known in the southern parts of America, this idea must be rejected, as having no foundation to support it; as the figure given by Aldrovandus is nothing more than a badger, to which the snout of a hog has been added. That author does not say this *taxus suillus* was drawn from Nature, nor does he give any description of the animal itself; and indeed the snout alone of the coati is sufficient to distinguish it from any other quadruped.

The coati has a practice of gnawing his own tail, which, when not mutilated, is longer than his body, and which he generally rears aloft, and moves with ease in any direction. This seemingly unnatural taste of gnawing their tails is not peculiar to the coati, for some monkies, and other animals with long tails, frequently shorten them a fourth, or even one-third, by eating the flesh and the joints. From this circumstance a general inference may be drawn, namely, that in very long members, the extremities of which must consequently be very remote from the centre of sensation, the feeling must be weak, and the more so the greater the distance

distance and the smaller the part; for if the extremities of the tails of these animals were very sensible, the pain excited would prevail over the inclination to mutilate, and they would preserve their tails with as much care as any other part of their body.

The coati is an animal of prey, which subsists on flesh and blood, and which, like the fox or marten, destroys small animals and poultry, hunts for the nests of birds, and devours their eggs; and it is, probably, from this conformity of disposition, rather than from any resemblance to the marten, that the coati has been considered as a small species of the fox.

THE AGOUTI.

THE Agouti (*fig. 98.*) is about the size of a hare, and has been considered by many writers as a kind of rabbit, or large rat; yet it bears a resemblance only in some trifling particulars to either, and in its natural habits it essentially differs

differs from them both. It has the rough hair, grunting, and voracious appetite of the hog; and when fully satiated it hides the remainder of its food, like the fox, in different places. It delights in gnawing and spoiling every thing it comes near. When irritated it bites fiercely; its hair stands erect along the back, and it strikes the ground violently with its hind feet. It does not dig holes, like the rabbit, but lives in the hollows of trees. It feeds chiefly on roots, potatoes, yams, and fruits, when residing near habitations; those that reside in the woods also eat leaves, plants, and shrubs. It uses its fore paws, like the squirrel, in carrying food to its mouth; it runs very swiftly up hill, or on even ground, but its fore paws being much shorter than its hind ones, upon a descent it is in great danger of falling; it has a good sight and excellent hearing, and whenever it hears a whistle it stops to listen. They scald the agouti and dress it like a sucking pig, and the flesh of such as are fat and well fed is tolerable food, though it has always a peculiar taste, and is rather tough. When they go among the sugar-canes they are easily taken, for sinking every step in the straw and leaves, which covers the ground, a man may come up and even kill them with a stick. When

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in the open country it runs with great swiftness before the dogs; and having gained its retreat, nothing can force it to come out but smoke; for which purpose the hunters burn faggots and straw before the mouth of the hole, upon which the animal makes plaintive cries like that of a pig, but seldom quits the place of concealment until the last extremity. Its cry, which it repeats often when it is irritated or incommoded, is exactly like that of a young pig. When taken young they are easily tamed, and will go out and return alone. When in a wild state, they generally dwell in the woods, where the female chooses the most obscure parts, and there prepares a bed of leaves and grass for her young. They usually bring forth two or three in a year, and in a day or two afterwards, she carries them in her mouth like a cat, into the hollow of some tree, where she suckles them for a short space, for they are soon in a condition to run about and provide for themselves; from which it appears that the time required for their growth is but short, and of course the duration of their lives cannot be long.

The agouti appears to be a native of the south parts of America, not being known in the old continent. They are common in Brasil, Guiana,

Guiana, St. Domingo, and all the islands around. To subsist and multiply, they require a warm climate, yet they will live in France if well sheltered from wet and cold, especially in winter; it is even a stranger in the cold and temperate climates in America. In the islands there is only this one species of agouti, which we have described, but in the other places above named, it is affirmed there is another species called the *agouchi*, which is much smaller than the first; but we have the testimony of several persons who resided a long time at Cayenne, who were equally acquainted with the agouti and agouchi, that the one we have described is certainly the agouti. The latter we have never been able to procure, but the former we had alive; it was as large as a rabbit, its hair was coarse, and of a brown colour, with a small mixture of red; its upper lip was cloven like that of the hair, its tail was shorter than that of a rabbit, its ears very short and broad, and its upper jaw was more prominent than the under; its snout was like that of the loir, and its teeth resembled the marmot's; its neck was long, its legs were slender, and on its fore feet it had four toes, and three on its hind ones. Marcgrave, and almost all naturalists after him, have said that the agouti has six toes on the
hind

hind feet. M. Brisson is the only writer who has not copied this error of Marcgrave; but he described it from nature, and, like us, perceived only three toes on the hind-feet.

SUPPLEMENT.

M. de la BORDE says, that the agouti is a very common animal in Guiana, that its flesh is as white as that of the rabbit, and is of a similar flavour; that they are hunted by dogs, taken in traps, and that the negroes take them in great numbers by whistling, or imitating their cries; that they principally feed upon nuts, which they collect and conceal in great quantities; that they are very prolific, producing as many, and as often as the rabbit; that they are easily tamed, but always retain somewhat of their savage disposition, yet if they go from home will return again of themselves; and that they keep in their holes during the night, unless the moon shines very clear, and are running about the greatest part of the day.

THE LION.

THE influence of climate is marked with but slight variations in the human species ; because that is entire in itself, and totally distinct from every other. Man, white in Europe, black in Africa, yellow in Asia, and copper-coloured in America, is still the same being, tinctured with the colour peculiar to the climate. And as he is formed to govern the earth, and as he has the whole globe for his habitation, it seems as if no situation was foreign to his nature ; under the scorching south, or in the frozen regions of the north, he lives, he multiplies, and has been so anciently diffused over every country, that he does not appear to have a particular propensity to any. It is far otherwise with other animals ; in them the influence of climate is marked with strong characteristics, because their species is diversified, and their nature is infinitely less perfect and more confined than that of man. Not only are the varieties in each species more numerous and more marked than

in the human species, but even the differences in the species themselves seem to depend on the differences of climate. Some animals can only breed in hot countries, others cannot subsist but in cold ones. The lion has never inhabited the northern regions, nor has the rein-deer ever been found in the south; and perhaps no species has been universally diffused over the face of the earth, besides that of man. Each has its country, its native soil, to which it is confined by a physical necessity; each is the immediate offspring of the region which it inhabits; and it is in this sense alone we say, this animal is a native of one climate, and that a native of another. In hot countries the terrestrial animals are larger and stronger than in the frozen or temperate ones. They are also more bold and ferocious; all their natural qualities seeming to partake of the ardour of the climate. Lions born under the scorching sun of Africa or the Indies, are of all others the most fierce and formidable. Our wolves and other carnivorous animals, far from being their rivals, are hardly worthy to be their purveyors.* The lions of America, if they deserve to be so called, are, like the climate, infinitely more mild; and what proves that the
degree

* There is a species of lynx which is called the lion's purveyor.

degree of their ferocity depends on the degree of heat is, that in the same country, those which inhabit the high mountains, where the air is temperate, are different in disposition from those that dwell in the plains, where the heat is excessive. The lions of Mount Atlas, of which the top is sometimes covered with snow, have neither the boldness, strength, nor ferocity of the lions of Biledulgerid, or the desart of Zaara, whose plains are covered with burning sands. It is principally in these burning desarts that those terrible lions are found which are the dread of travellers and the scourge of neighbouring provinces. Happily for man this species is not numerous, and seems to diminish daily; for those who have travelled through this part of Africa affirm they are by no means so numerous now as they were formerly; and Mr. Shaw, in his travels, says, the Romans drew fifty times as many lions from Lybia, to combat in their amphitheatres, as are now to be found in the whole country. It is also remarked, that in Turkey, Persia, and India, lions are much less numerous than they were in ancient times. Since this animal preys on every other species of quadruped, and is himself the prey of none, it is obvious that its decrease can only be occasioned by the increase
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of mankind, who are the only beings in nature capable of making head against this king of beasts; and it must be allowed, powerful as he may be, he is no match for even a Hottentot or negro, who often attack him, and very seldom without coming off victorious. As the lion has no enemy but man, and his species being reduced to the fiftieth, or even the tenth part of what it was formerly, it follows that the human species instead of having suffered a considerable diminution since the time of the Romans, as is by some pretended, is on the contrary more generally diffused, and more numerous even in such countries as Lybia. The industry of man increases in proportion with his number, but that of other animals remains always the same. Every destructive species, like that of the lion, seems to be driven to distant countries, or reduced to small numbers, not only because man has become every where more numerous, but because he has become more skilful and invented dreadful arms of destruction, which nothing can resist; arms, which it were well, had they never been employed against aught but lions and tigers.

This superiority of numbers, and industry in man, which has subdued the lion, serves also to enervate and discourage him, for
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he is brave only in proportion to the success of his encounters. In the vast deserts of Zaara, in the burning sands which separate Mauritania and Negro-land, and in all the deserts of Asia and Africa, where man has disdained to fix his habitation, lions are still numerous and preserve their natural force and courage. Accustomed to measure their strength with every animal they meet, the habit of conquering renders them intrepid and terrible. Having never experienced the power of man, they have no apprehension of him, but boldly face and hold him in defiance. Wounds enrage, without repressing their ardour; they are not daunted even by the appearance of numbers. A single lion of the desert often attacks a whole caravan, and if, after an obstinate engagement, he finds himself overpowered, instead of flying, he retreats fighting, and faces the enemy to the last. On the contrary, those lions which inhabit the peopled countries of Morocco, or India, having become acquainted with man, and experienced the superiority of his arms, have lost their native courage to such a degree, that they are to be scared away with a shout, and seldom attack any but the unresisting flocks and herds, which even women and children are sufficient to protect against them.

This alteration, this amelioration in the disposition

position of the lion, proves that he might be tamed to a certain degree, and admit of a species of education. We read in history of lions being yoked to triumphal cars, led forth to the field of battle, or let loose to the chace, and that faithful to their master, they never exerted their strength or courage but against his enemies. Certain it is that the lion when taken young, and bred up with domestic animals, becomes familiar and sports innocently among them ; that he will even be caressing to his master, and that if his natural ferocity returns, he seldom exercises it against his benefactor. As his passions are strong, and his appetites vehement, we ought not to presume that the impressions of education will always overbalance them ; and therefore it would be dangerous to suffer him to remain too long without food, or wantonly to persist in irritating or tormenting him. He is not only enraged by bad treatment, but remembers it and meditates revenge ; in the same manner he also remembers benefits and endeavours to shew his gratitude for them. In support of this we might recapitulate a number of facts, in which however there is probably much exaggeration ; but it is sufficient that they prove his anger is noble, his courage magnanimous, and his disposition grateful and susceptible of impression. He has often been

seen to despise contemptible enemies, and to pardon their insults when it was in his power to punish them. When in confinement he appears gentle, will caress the hand that feeds him, and will sometimes spare the lives of those animals which are thrown to him for prey ; he will even live peaceably with them, spare them part of his subsistence, and has even been known to want food himself rather than be the means of depriving them of that life which his generosity had spared. The lion cannot be said to be cruel, since he acts from necessity and never kills more than he consumes ; while the tiger, the wolf, and all the inferior species, such as the fox, marten, polecat, ferret, &c. kill without remorse, and seem rather to satisfy their malignity than their hunger.

The outward form of the lion speaks the superiority of his internal qualities. His figure is striking and grand ; his look confident and bold ; his gait stately, and his voice tremendous. His bulk is not overgrown like that of the elephant, or the rhinoceros ; nor is his shape clumsy like the hippopotamus, or the ox. He is in every respect compact and well-proportioned ; a perfect model of strength joined with agility. He is muscular, bold, and neither charged with fat nor unnecessary flesh. He
manifests

manifests his muscular power by the ease with which he makes prodigious bounds and leaps ; by the strong and swift movements of his tail, which is alone sufficient to strike a man to the earth ; by the facility with which he moves the skin of his face, and particularly that of his forehead, which adds greatly to the expressions of fury in his countenance; and, lastly, by the power he has of moving the hair of his mane, which not only bristles up but is agitated on all sides when he is enraged.

To these eminent qualities the lion joins all the dignity of his species. By dignity of species I mean those whose nature is permanent, invariable, and not subject to degradation. In those animals to which this singular advantage belongs, the characteristics are so strongly marked, that they cannot be mistaken nor confounded with any other species. In man, the noblest being of the creation, the species is sole and entire, because all the individuals of it, of whatever race, climate, or complexion, may intermix and produce together ; and because it cannot be said that any animal approaches to man in any natural degree. The horse is less noble considered as a species than as an individual, since the neighbouring one of the ass is so near, that one of each species will
produce

produce animals which Nature reprobates as bastards, unworthy of either race, and renders incapable of perpetuating either species from whence they sprung, but which in itself exhibiting a mixture of both, proves, beyond a doubt, their close affinity. The species of the dog is perhaps less noble, because he seems to be allied to that of the wolf, the fox, and jackall, who may all be considered as degenerate branches of the same family. In descending by degrees to the inferior species, such as the rabbit, weasel, rat, &c. we shall find that each of them has such a number of collateral branches that we cannot trace the original stock ; and, lastly, in the tribes of insects, each species is accompanied with such a number of approximate ones that we are obliged to consider them as belonging to a certain genera. This is the only use of what is called *method* in Natural History, which ought never to be employed unless in the difficult enumerations of small objects, as it becomes useless and ridiculous when treating of beings of the first rank. To class man with the monkey, or to say that a lion is a cat with a long mane and tail, is rather to degrade and disfigure Nature than to describe and denominate her works. The species of the lion,

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therefore is one of the most noble since it is most entire, and cannot be confounded with those of the tiger, leopard, ounce, &c. and since those species, which appear to be the least remote from the lion, are so little distinct from each other, as to have been perpetually mistaken and confounded by travellers and nomenclators.

The largest lions are about eight or nine feet in length, from the snout to the tail, which is four feet long, and are between four and five feet high. Those of the small size are about five feet and a half long, three feet and a half high, and their tail rather more than three feet long. In all her dimensions the lioness is about one fourth less than the lion. Aristotle divides lions into the greater and smaller, and the latter, he says, are short in proportion, have their hair more frizzled, and are less courageous than the former. He adds, that in general all lions are yellow. The first of these assertions appears doubtful, since no traveller has mentioned lions with frizzled hair; some authors, indeed, who, in other respects do not merit entire confidence, speak of a tiger with curled hair found at the Cape of Good Hope; but almost all testimonies agree as to the colour of the lion, which is uniformly yellow on the

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FIG: 99

Lion.

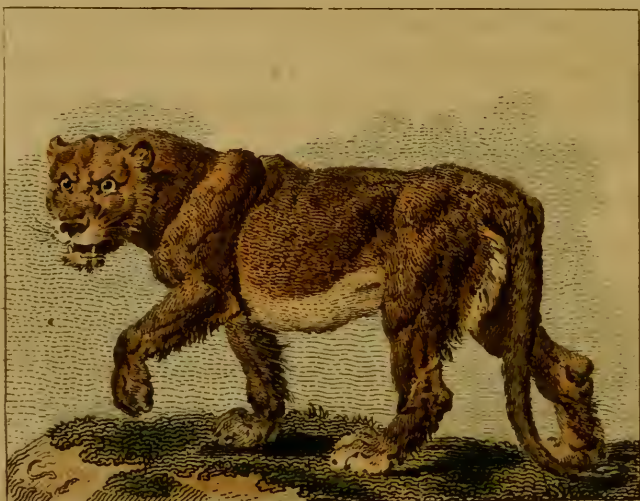


FIG: 100

Lioness.

the back and within on the sides and belly. Ælian and Opiā have asserted, that in Ethiopia the lions are as black as the men; that in India there are some white and others spotted and striped with red, black, and blue; but this is not confirmed by any authentic testimony, for Marco Polo the Venetian, does not speak of these striped and spotted lions as if he had seen them, and Gesner observes that he only mentions them on the authority of Ælian. It appears on the contrary, that there are few or no varieties in these species; that the lions of Asia and Africa perfectly resemble each other, and that those of the plains differ less in colour from those which dwell in the mountains than in size.

The lion (*fig. 99.*) is furnished with a mane, or rather long hair, which covers all his foreparts, and becomes longer as he advances in age; but the lioness, (*fig. 100.*) however old, is without this appendage. The American animal, which the natives of Peru call Puma, and the Europeans Lion, has no mane, and is smaller, weaker, and more cowardly, than the real lion. It is not impossible that the mildness of the climate in South America might have such influence on the nature of the lion as to strip him of his mane, reduce his size,

size, and repress his courage ; but it appears absolutely impossible that this animal, which inhabits the tropical regions only, and to whom Nature, to all appearance, has shut up every avenue to the north, should pass from the southern part of Asia or Africa into America, those continents being divided towards the south by immense seas. From this circumstance it is probable that the puma is not the lion, deriving its origin from those of the old continent and since degenerated, but that he is an animal peculiar to America, like other animals found on the new continent.

When the Europeans first discovered America, the quadrupeds, birds, fishes, insects, plants, and almost every thing appeared to be different from what they had seen before. Of this new world it was therefore necessary to denominate the principal objects. As the names given by the natives were for the most part barbarous and difficult to pronounce or remember, names were borrowed from the European languages, especially from the Spanish and Portuguese. In this dearth of denominations, a small affinity in external appearance, size, or figure, was sufficient to attribute to unknown objects the names of those that were familiar. Hence the doubt, perplexity, and confusion which has considerably increased, since, at the same

same time that the productions of the new continent were receiving the denominations of those of the old one, plants and animals peculiar to the latter were transporting there in abundance. To remove this obscurity, and to avoid falling into perpetual errors, it is therefore necessary to distinguish carefully what belongs to the one continent from what belongs to the other. Of this distinction I shall shew the necessity in the next article, where I shall enumerate not only the animals which are natives of America, but those which have been carried thither.

M. de la Condamine, whose testimony deserves our full confidence, says expressly, that he does not know whether the American animal which the Spaniards call Lion, and the natives of Quito, Puma, deserves the name of Lion; he adds, that it is much smaller than the African lion, and that the male has no mane. Frezier also says, that the animals called lions in Peru are very different from those of Africa; that they avoid the sight of man, and commit no havock but among the cattle; and he further remarks that their heads bear a strong resemblance to the heads of both the wolf and the tiger, and have tails shorter than that of either. In more ancient relations, we are told that the lions of America by no means resemble
those

those of Africa ; that they have neither their size, nor fierceness, nor colour ; that they are neither red, nor yellow, nor grey ; that they have no mane, and that they have a custom of climbing up trees. Differing, then, from the lion in size, colour, form of the head, length of the tail, want of the mane, and lastly, in natural habits, no longer ought the Puma of America to be confounded with the real lion of Africa or Asia.

Though this noble animal inhabits only the hottest regions, yet he will live, and, with care, might even breed in temperate ones. Gesner mentions that lions were brought forth in the menagerie of Florence ; and Willoughby tells us, that at Naples, a lioness which had been confined with a lion, produced five whelps at one litter. Such examples are rare, but if true, they prove that lions are not absolutely averse to mild climates. At present there are none of them in the southern parts of Europe ; so early as the days of Homer, there were no lions in Peloponnesus, yet they existed in Thrace, Macedonia, and Thessaly, in the time of Aristotle. It is, therefore, evident that in all ages they have given the preference to the hottest climates ; that they seldom resided in temperate ones, and never in the frozen regions of the north. The naturalists above quoted,
though

though they mention lions being brought forth in Florence and Naples, are silent as to the time of gestation in the lionness, the size of the young, when whelped, and the degrees of their growth. *Ælian* says she goes only two months, while *Philostratus* and *Edward Wotton* affirm it to be six. I think the latter opinion is nearest the truth, because the lion is an animal of great magnitude, and in general the time of gestation is longer among the large than the small species. Thus it is also with the growth of the body. Both ancients and moderns allow that the new-born lion is not bigger than the weasel, that is from six to seven inches long ; if so, several years must elapse before he can increase to eight or nine feet. It is also said that they cannot walk before they are two months old. But, without giving entire credit to these assertions, we may with probability presume, from the largeness of the size, that he is three or four years in acquiring his full growth, and that he consequently lives to about the age of twenty-five. The *Sieur de St. Martin*, master of the bull-fights at Paris, who willingly communicated to me the observations he had made upon the lions which he reared, assured me that he has kept lions for fifteen or sixteen years, and that he does not believe they live above the age of twenty or twenty-two.

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But it must be evident the want of exercise, constraint, and irksomeness of situation to those which are in confinement, must impair health and shorten life.

In two different parts of his treatise on animals, Aristotle states that the lioness produces five or six whelps at her first litter, four or five at the second, three or four at the third, two or three at the fourth, and one or two at the fifth, and after which she becomes barren. This assertion is ungrounded, since in all animals the first and last litters are always the least numerous. This philosopher erred also, as well as all the naturalists that came after him, in maintaining that the lioness had but two nipples, it being a certain and well known fact that she has four, as may be known by simple inspection. He likewise asserts that the lion, bear, and fox, are unformed at their birth; but it is now known that these animals are brought forth as perfect as any other, and that their members are distinct and developed. He says too that the lions copulate in a backward disposition; but from a bare inspection it is demonstrable that they engender in the same manner as other quadrupeds. I have noticed these errors in Aristotle minutely, as the authority of such a great man has misled all authors who have since given the history of animals.

animals. His assertion also, that the neck of the lion contains but one rigid and inflexible bone, has been contradicted by experience; for in all quadrupeds, without exception, and even in man, the neck is composed of seven vertebræ; and it is also another certain fact, that in general, carnivorous animals have a much shorter neck than granivorous, and especially than the ruminating ones. It is also stated by Aristotle, that the bones of lions have neither cavity nor marrow; that they are as hard as flint, and possess the property of striking fire by friction; but such errors ought not to have been repeated by Kolbe, nor handed down to posterity, since even in the days of Aristotle they were ridiculed by Epicurus.

The lion is particularly furious when roused by love. A female when in season will have eight or ten males in her train, who fight most bloody battles, till one of them becomes victorious over the rest. She brings forth in spring, and does not produce more than once a year, which also proves that she is employed for some months in tending and suckling her young, and consequently the time required for their first growth, while they are in need of the assistance of their dam, must at least be some months. In this animal all the passions, even of the most gentle kind, are in excess.

The attachment of the lioness to her young is astonishingly great; though naturally less strong and courageous than the lion, she becomes terrible when she has young. She then makes her incursions without fear; attacks indiscriminately men and animals, destroys without distinction, loads herself with the spoil, and carries it home to her whelps, whom she accustoms betimes to blood and slaughter. She usually brings forth in the most retired and inaccessible places, and when afraid of having her retreat discovered, she hides her tracks by traversing back the ground, or brushing them out with her tail. She sometimes also, when her apprehensions are great, transports them to a different place, and if obstructed, she defends them with a determined fury, and fights to the last extremity.

It is asserted that the lion is not possessed of either the sense of smelling or seeing in such perfection as most other animals of prey; a strong light incommodes him, so that he seldom goes abroad in the middle of the day, but commits all his ravages in the night; and when a fire is kindled near a herd, he never approaches them. His smell is also so faulty, that he hunts by the eye only. A species of lynx, which has a piercing eye and acute smell, has indeed procured the name of the lion's guide,

guide, or purveyor, and it is said that he always accompanies or precedes the lion, to direct him to his prey. This is a small weak animal, which sometimes follows the lion, though he would most probably avoid him, did he not frequently come in for a share of that spoil which the lion leaves.

The lion, when hungry, boldly attacks all animals that come in his way; but as he is very formidable, and they all seek to avoid him, he is often obliged to conceal himself for an opportunity of taking them by surprise. This he does by couching upon his belly in some thicket, where he patiently waits the approach of his prey, and which he springs at with such force as often to seize it the first bound; but if in the end his prey escapes, he stands motionless, and seems hurt at the disappointment. In the deserts and forests gazelles and monkeys are his common food; the latter, however, he only takes when upon the ground, as he cannot climb trees like the tiger or puma. He devours as much at once as will serve him for two or three days. His teeth are so strong that he easily breaks the bones and swallows them with the flesh. He is said to be capable of supporting hunger for a long time, but from the heat of his temperament he is less patient of thirst; he drinks as often as

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he can meet with water, which he laps like a dog, but with his tongue bent downwards. He requires about fifteen pounds of raw flesh every day; he prefers that of living animals, particularly of those he kills himself; he seldom devours putrid carcases, and chooses rather to hunt for fresh spoil than to return to what he had left on a former day. Though he usually feeds upon fresh provisions his breath is very offensive, and his urine insupportable.

The roaring of the lion is so loud, that when uttered in the desarts by night, and re-echoed by the mountains, it resembles thunder. This roar is his natural note, for when enraged he has a short and quickly reiterated growl; but the roar is a long, deep, hollow cry, which he sends forth five or six times a day, or oftener before rain. His cry of anger is much louder, and still more terrible. He then beats his sides and the earth with his tail, erects his mane, puts the skin of his face, and eyebrows, in motion, shews his tremendous teeth, thrusts out his tongue, which is covered with such sharp hard points, that it is alone sufficient to flay and chew the food without the aid of teeth or nails. He is much stronger in the head, jaws, and fore-legs, than in any of his hind parts. He sees better in the night than by day,
and

and though his sleep is short, and he is easily awakened, yet there is no foundation for the assertion that he sleeps with his eyes open.

The usual pace of the lion is bold, solemn, and slow, though always oblique. When in chase he rather bounds than runs, and his motions are so precipitate, that he cannot stop suddenly, but generally surpasses his intention. When he darts on his prey he leaps the distance of twelve or fifteen feet, seizes it with his fore-feet, tears it with his paws, and then devours it with his teeth. While young and active he lives by the chace, and seldom quits the desarts or the forests, where he finds a sufficiency of wild animals for his purpose; but when he grows old, heavy, and less qualified for exercise, he approaches frequented places, and becomes a more dangerous enemy to man and domestic animals. It is observed, however, that when he sees men and animals together, he attacks the latter, and never the former, unless he is struck; in which case, always distinguishing from whom the blow came, he quits his prey to take revenge for the injury. He is said to prefer the flesh of the camel to that of any other animal; he is also exceedingly fond of young elephants, which, from their inability to resist until thir tusks are grown, he easily dispatches, when unprotected

by their mothers, nor are there any animals able to resist the lion but the elephant, rhinoceros, tiger, and hippopotamus.

However powerful this animal may be it is not uncommon for large dogs, supported by men on horseback, to chace, dislodge, and force him to retire ; but it is necessary for both dogs and horses to have been well disciplined, as animals tremble and fly at the very smell of the lion. Though his skin is firm and compact it is not proof against a ball, or even a javelin ; yet he is seldom dispatched with one blow. He is often taken like wolves, by slightly covering a pit, and fastening a live animal over it. When thus entrapped all his fury subsides, and if advantage is taken of the first moments of his surprise and shame, he may be chained, muzzled, and conducted any where without resistance.

The flesh of the lion is of a strong and disagreeable flavour, yet the Negroes and Indians do not dislike it, and frequently make it part of their food. The skin, formerly the tunic of heroes, serves these people for a mantle ; they likewise preserve the grease, which is of a penetrating quality, and is of some use in medicine.

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